Company, Inc., a corporation organized and existing under the laws of the State of New Jersey and having a regular and established place of business at Middlesex, New Jersey, and within the Judicial District of New Jersey, jointly and severally, and thereupon plaintiff complains and says:

First: That this is a suit arising under the Patent Statutes of the United States.

Second: That the defendants, and each of them, are corporations duly organized and existing under the laws of the State of New Jersey and that the acts of infringement and of contributory infringement hereinafter set forth and complained of were committed by the defendants, jointly and severally, within the Judicial District of New Jersey, and within which district the defendants, and each of them, are resident and have a regular and established place of business.

Third: That heretofore and prior to the twelfth day of October, 1925, Harold P. Hayden, of Woodbridge, New Jersey, was the original, first and sole inventor of certain new and useful improvements in method of preventing evaporation from concrete during curing (fully described in the letters patent hereinafter mentioned), which had not been known or used by others in this country before his invention or discovery thereof, and not patented or described in any printed publication in this or any foreign country before his invention or discovery thereof, or more than two years prior to his hereinafter-mentioned application for Letters Patent of the United States therefor, and not in public use or on sale in this country for more than two years prior to his said application, and not abandoned, nor patented nor caused to be patented in any foreign country by himself or his legal representatives or assigns on an application made more than

twelve months prior to his said application for Letters Patent of the United States.

Fourth: That thereafter, on the twelfth day of October, 1925, the said Harold P. Hayden, being the original, first and sole inventor of the said invention and entitled to a patent therefor, duly filed in the United States Patent Office an application, in writing, addressed to the Commissioner of Patents, for patent on his said invention, and thereafter, all the requirements of the statutes in such cases made and provided having been duly complied with, Letters Patent of the United States No. 1,684,671, bearing date September 18, 1928, were duly granted on the said application of Harold P. Hayden and issued to The Barber Asphalt Company, the plaintiff herein, in accordance with assignment hereinafter mentioned. Plaintiff hereby makes profert of original Letters Patent No. 1,684,671, or a duly certified copy thereof, ready in court to be produced.

Fifth: That prior to the filing of his said application for patent and to wit on October 6, 1925, said Harold P. Hayden, by an instrument in writing, duly executed and acknowledged, duly assigned the entire right, title and interest in and to said application for patent, the invention disclosed therein and the letters patent to be obtained thereon to The Barber Asphalt Company, the plaintiff herein, its successors and assigns, and which assignment was duly recorded in the United States Patent Office on January 18, 1928, in Liber M 132, page 271, of Transfers of Patents. Plaintiff hereby makes profert of said assignment, or a duly certified copy thereof, ready in court to be produced.

Sixth: That The Barber Asphalt Company, the plaintiff herein, has been, ever since the issue of said

Letters Patent No. 1,684,671, and now is the owner of said Letters Patent No. 1,684,671.

Seventh: Plaintiff avers that since the acquirement by it of ownership of said patented invention and the letters patent therefor, plaintiff has widely publicized the method in accordance with said patent, and plaintiff has sold and is selling large quantities of bituminous material for use in carrying out the said method according to and embodying the invention described and claimed in said letters patent; that the method embodying the invention constituting the subject matter of said letters patent has gone into extensive use in the United States, under licenses from plaintiff granted for valuable considerations, and particularly for the curing of concrete in connection with the paving of highways and streets; that large sums of money have been invested and expended by the plaintiff in promoting the use of and perfecting said patented method and in developing the invention thereof; that the said invention has been and is now of great value to the plaintiff; that the exclusive right to control the said invention and the ~~Letters~~ Patent No. 1,684,671 thereon, and the practice of the method covered by the said Letters Patent No. 1,684,671, has been and still is of great advantage and profit to the plaintiff; and that the plaintiff at all times has stood ready and still stands ready to supply the public demand for bituminous material for the carrying out of said method and to permit the carrying out of said method with bituminous material purchased from plaintiff.

Eighth: Plaintiff further avers, on information and belief, that the defendants, Stultz-Sickles Company and Leitch Manufacturing Company, Inc., well knowing the premises, without license and right, against the

will of the plaintiff and in violation and infringement and in contributory infringement of said Letters Patent No. 1,684,671 and of the plaintiff's exclusive rights granted and secured thereby, as aforesaid, have, jointly and severally, since the date of said Letters Patent No. 1,684,671, and with full knowledge thereof, within the period of six years last past, and within the Judicial District of New Jersey and elsewhere in the United States, infringed and contributed to the infringement of said Letters Patent No. 1,684,671 by selling and offering for sale and supplying in the Judicial District of New Jersey, and elsewhere in the United States, bituminous emulsion for use in carrying out the method embodying the invention of and patented by said Letters Patent No. 1,684,671, in infringement thereof, and with full knowledge and intent that such bituminous emulsion was to be so used; and plaintiff further avers that the defendant Leitch Manufacturing Company, Inc., with full knowledge of said letters patent, within a period of six years last past and within the Judicial District of New Jersey and elsewhere in the United States, in infringement and contributory infringement of said Letters Patent No. 1,684,671, sold or supplied bituminous emulsion to the defendant Stultz-Sickles Company, with full knowledge and intent that such bituminous emulsion was to be resold by Stultz-Sickles Company for the purpose of practicing the method embodying the invention of and patented by said Letters Patent No. 1,684,671 and in infringement thereof; and plaintiff further avers that defendant Stultz-Sickles Company, with full knowledge of said letters patent, within a period of six years last past, and within the Judicial District of New Jersey and elsewhere in the United States, in infringement and contributory infringement of said Letters Patent No. 1,684,671, sold bituminous emulsion procured from the defendant Leitch Manufacturing Company, Inc., with

full knowledge and intent that it be used in carrying out the method embodying the invention of said Letters Patent No. 1,684,671, and in infringement thereof.

Ninth: Plaintiff avers that defendants, jointly and severally, are continuing to infringe and contribute to the infringement of said Letters Patent No. 1,684,671.

Tenth: Plaintiff further avers that the infringement of Letters Patent No. 1,684,671 by the defendants herein complained of has greatly profited the defendants, Stultz-Sickles Company and Leitch Manufacturing Company, Inc., jointly and severally, and has and is causing great and continuing irreparable loss, injury and damage to plaintiff; and, further, that such infringement is greatly interfering with the plaintiff's business of producing and selling bituminous material for use in practicing and carrying out the method patented by said Letters Patent No. 1,684,671, and plaintiff fears, and has reason to fear, that unless the defendants, Stultz-Sickles Company and Leitch Manufacturing Company, Inc., jointly and severally, forthwith and henceforth are restrained by writ of injunction issuing out of this Court, said defendants will, jointly and severally, continue to infringe said Letters Patent No. 1,684,671, and will induce and lead others to infringe the same, and will thereby cause further and irreparable loss, injury and damage to the plaintiff and its aforementioned vested rights.

WHEREFORE, plaintiff prays:

I. For a perpetual injunction and a preliminary injunction pending this suit restraining the defendants, Stultz-Sickles Company and Leitch Manufacturing Company, Inc., jointly and severally, their agents, officers, servants, attorneys, workmen and employees, from directly or indirectly infringing said Letters Patent No. 1,684,671.

II. For an accounting of profits derived from, and damages due to, such infringement, and that the defendants, Stultz-Sickles Company and Leitch Manufacturing Company, Inc., jointly and severally, may be compelled to pay over to the plaintiff the said damages and profits, and that the damages be increased not to exceed three times, as provided for by law in view of the wilful nature of the infringement.

III. For costs; and

IV. For such other and further relief as to equity may seem just and right.

Plaintiff further prays for a writ of *subpœna ad respondendum* directed to the defendants, Stultz-Sickles Company and Leitch Manufacturing Company, Inc., jointly and severally, commanding them, and each of them, to appear and make answer to this bill of complaint and to perform and abide by such order and decree herein as to this Court may seem just and be required by the principles of equity and good conscience.

THE BARBER ASPHALT COMPANY.

By C. W. Bayliss,
Vice-President.

Attest:

E. R. Riter,
(Seal) *Secretary.*

Pitney, Hardin & Skinner,
Solicitors for Plaintiff.

Frank S. Busser,
George J. Harding,
Of Counsel.

STATE OF PENNSYLVANIA, }
COUNTY OF PHILADELPHIA, } *ss.:*

C. W. BAYLISS, being first duly sworn, deposes and says that he is the vice-president of The Barber Asphalt Company, the plaintiff named in the foregoing bill of complaint; that he has read said bill and knows the contents thereof; that the same is true of his own knowledge, except as to matters therein stated to be alleged on information and belief, and that as to those matters he believes it to be true; and that he verily believes that Harold P. Hayden is the true, sole and original inventor of the subject matter disclosed in Letters Patent No. 1,684,671 identified and referred to in said bill.

C. W. BAYLISS.

Subscribed and sworn to before me this thirteenth day of July, 1934.

O. H. HERTKORN,
(Seal) *Notary Public.*
My commission expires January 26, 1937.

ANSWER TO BILL OF COMPLAINT.

(Filed September 28, 1934.)

To the Honorable, the Judges of the District Court of the United States, for the Judicial District of New Jersey:

Defendants for answer to the bill of complaint herein, or to as much thereof as they are advised is material or necessary to be answered, on information and belief say:

1. Referring to paragraph 1 of the bill of complaint, defendants admit the jurisdiction of this Court under the Patent Statutes of the United States.

2. Defendants admit paragraph 2 of the bill of complaint except that they deny that they either jointly or severally, either within the Judicial District of New Jersey or elsewhere, committed any acts either of infringement or contributory infringement of the patent in suit.

3. Referring to paragraph 3 of the bill of complaint, defendants deny each and every allegation contained therein.

4. Answering paragraph 4 of the bill of complaint, defendants admit that the United States Letters Patent No. 1,684,671, bearing date September 18, 1928, was granted on application of Harold P. Hayden, but otherwise deny each and every allegation contained in this paragraph of the bill of complaint.

5, 6, 7. Defendants are without knowledge as to the allegations set forth in paragraphs 5, 6 and 7 of the bill of complaint, except as obtained therefrom, and therefore leave plaintiff to his proof.

8, 9, 10. Defendants deny each and every allegation of paragraphs 8, 9 and 10 of the bill of complaint.

11. Defendants, upon information and belief, aver that the aforesaid Hayden patent is invalid and void because the said Hayden was not the original and first inventor of the alleged improvements described and claimed therein, but the same in all its material and substantial elements was known and used by others in this country before his alleged invention or discovery thereof, was patented and described in printed publications in this and foreign countries before his alleged invention or discovery thereof, or more than two years prior to his application for patent, and that the patents and printed publications above referred to, insofar as they have at present been ascertained, are as follows:

Number	*Name*	*Date*
958,063	Amies	May 17, 1910
1,105,580	Richardson	July 28, 1914
1,035,787	Headley	Aug. 13, 1912
158,415	Hubbell	Jan. 5, 1875
1,010,209	Zimmer	Nov. 28, 1911
1,315,749	Stubbs	Sept. 9, 1919

"The American City," Vol. 26, No. 5, May, 1922, pages 453 and 454.

12. Defendants aver that the claims of the aforesaid Hayden patent in suit are ambiguous and that when said claims are and shall be truly correctly and lawfully construed by reference to the specification of said letters patent, and the art existing at and prior to the alleged invention of the subject matter of the said claims, the latter and each of them will be legally susceptible to such interpretation, meaning and scope, that no act ever done or intended to be done by the defendants herein can be justly and lawfully held to involve infringement of the aforesaid patent or any of the claims thereof.

13. Defendants aver that the aforesaid letters patent were issued by the United States Patent Office without due investigation and that an important part of the relevant prior art was improperly applied and construed, wherefore the Commissioner of Patents exceeded his legal authority in granting the aforesaid letters patent, and the latter are, therefore, void and of no legal effect.

14. Defendants aver that in view of the statements and admissions and allegations of said Hayden, contained in said letters patent in suit and in the proceedings in the Patent Office on application for said letters patent, the matters and things claimed in said letters

patent do not identify any invention or improvements patentably distinguishable from the prior art.

15. Defendants aver that the claims of the aforesaid Hayden patent in suit when truly correctly and lawfully construed by reference to the specification of the said letters patent as originally filed, will be legally susceptible only to such interpretation, meaning and scope, that no act ever done or intended to be done by the defendants herein can be justly and lawfully held to involve infringement of the aforesaid letters patent or any of the claims thereof.

16. Defendants aver that the aforesaid letters patent to Hayden are invalid because they do not set forth the manner and process of making, constructing, compounding and using the alleged invention in such full, clear, concise and exact terms as to enable any person skilled in the art or science to which they appertain, to make, construct, compound and use the same; but, on the contrary, those skilled in the art, by following the teachings of the said letters patent, would obtain a product devoid of utility.

17. Defendants aver that said letters patent of Hayden are invalid and void for the reason that the production of everything therein shown and described required no exercise of the inventive faculty, but merely the ordinary knowledge possessed by those skilled in the art to which said letters patent pertain.

18. Defendants aver that said letters patent to Hayden are invalid and void for the reason that said Harold P. Hayden and the plaintiff, in the course of the prosecution of the application for said letters patent, knowingly made misrepresentations to the Patent Office as to the alleged invention and as to the prior art, and thereby induced the Commissioner of Patents to issue said letters patent in excess of his legal authority.

19. Defendants allege that plaintiff's admission that he is attempting to exercise a monopoly of common asphalt paint, using the aforesaid letters patent to provide a color of legality, is in violation of the Patent Law of the United States and bars plaintiff from any relief.

20. Defendants allege that they have at no time or place made use, nor aided anyone else in the use, of the alleged improvements claimed in said letters patent to Hayden; that they have never practiced any process, or aided anyone else in the practice of a process, in the infringement of any rights of the claims under the aforesaid patent, or damaged the plaintiffs in receipt thereof, or profited by reason of anything contained in or covered by said letters patent.

21. Defendants deny each and every allegation of said bill of complaint, except as hereinbefore specifically admitted, and deny all manner of wrongdoing wherewith they are charged by the said bill of complaint, all of which matters and things these defendants are willing to maintain and prove as this Honorable Court shall direct, and pray that the bill of complaint herein be dismissed with costs and disbursements against the plaintiffs.

WHEREFORE, defendants pray that the bill of complaint of the plaintiff herein be dismissed with costs and disbursements to the defendants, and that the defendants have judgment and execution therefor.

STULZ-SICKLES COMPANY AND
LEITCH MANUFACTURING CO.,
INC.

By OSBORNE, CORNISH & SCHECK,
Counsel for Defendants.

SAMUEL OSTROLENK,
Of Counsel.

STATE OF NEW JERSEY,
COUNTY OF ESSEX, } *ss.:*

EDW. A. STULZ, being duly sworn, deposes and says that he is president of Stulz-Sickles Company, one of the defendants named in the foregoing answer; that he has read the same and knows the contents thereof, and that the same is true of his own knowledge except as to those matters said to be alleged on information and belief, and as to those matters, he believes it to be true.

EDW. A. STULZ.

Sworn to and subscribed before me this twenty-eighth day of September, 1934.

F. J. KUGELMANN,
(Seal) *Notary Public of New Jersey.*
My commission expires May 19, 1936.

STATE OF NEW YORK,
COUNTY OF NEW YORK, } *ss.:*

C. A. LEITCH, being duly sworn, deposes and says that he is president of Leitch Manufacturing Company, Inc., one of the defendants named in the foregoing answer; that he has read the same and knows the contents thereof, and that the same is true of his own knowledge except as to those matters said to be alleged on information and belief, and as to those matters he believes it to be true.

C. A. LEITCH.

Sworn to and subscribed before me this twenty-seventh day of September, 1934.

FLORENCE BRENES,
Notary Public.
Bronx Co. Clerk's No. 238, Reg. No. 234B35.
Certificate filed in N. Y. County.
New York Co. Clerk's No. 1205, Reg. No. 5B775.
Commission expires March 30, 1935.

MOTION FOR LEAVE TO AMEND ANSWER

Now come the defendants, Stulz-Sickles Company and Leitch Manufacturing Company, Inc., defendants in the above-entitled cause, and move this Court for leave to amend the answer filed in the above-entitled cause as follows:

By adding at the end of paragraph eleven on page two of the answer the words:

U. S. patent 1,073,129 of Aaron C. Horn issued in 1913

U. S. patent 1,737,006 of Carleton Ellis issued in 1929

German patent 337,134 of Paul Leghler issued in 1921

OSBORNE, CORNISH & SCHECK,
Solicitors for Defendants.

SAMUEL OSTROLENK,
Of Counsel.

AMENDMENT TO ANSWER.

PLEASE TAKE NOTICE that at the trial of this case defendants, Stulz-Sickles Company and Leitch Manufacturing Company, Inc., will in addition to the defenses set forth in the answer, rely for defense and will pursuant to section 4920, Revised Statute, prove the following matters:

U. S. Letters Patent 1,684,671, relied upon by complainant in this suit, and the claims thereof are void and of no legal effect for the reason that the alleged invention or improvement for which said letters patent were granted have been patented and/or described in printed publications prior to his supposed invention or discovery thereof by the alleged inventor, and more

than two years prior to his application therefor, and particularly the following letters patent:

U. S. Patent 1,073,129 of Aaron C. Horn issued in 1913;

U. S. Patent 1,737,006 of Carleton Ellis issued in 1929;

German Patent 337,134 of Paul Leghler issued in 1921.

Attached hereto is a copy of a motion to amend defendants' answer in accordance with the foregoing notice to be made by defendants at the trial of this case.

OSBORNE, CORNISH & SCHECK,
Solicitors for Defendants.

SAMUEL OSTROLENK,
Of Counsel.

Service of the within amendment to answer and motion for leave to amend answer is hereby acknowledged this thirtieth day of November, 1934.

PITNEY, HARDIN & SKINNER,
Solicitors for Complainant.

NARRATIVE FORM OF TESTIMONY PURSUANT TO EQUITY RULE NO. 75.

(Filed August 21, 1936.)

IN THE DISTRICT COURT OF THE UNITED STATES,
FOR THE DISTRICT OF NEW JERSEY.

No. 4911. IN EQUITY.

ON HAYDEN PATENT No. 1,684,671.

The Barber Asphalt Company,
Plaintiff,

v.

Stulz-Sickles Company and Leitch Manufacturing Company,
Defendants.

In the opening statement the process of the patent in suit, Plaintiff's Exhibit 1, was briefly outlined and the stipulation of fact, Plaintiff's Exhibit 2, discussed at some length with reference to the Dry Ice case.

The Court considered the issue of contributory infringement in view of the facts as presented by the stipulation and decided that issue in the following discussion:

MR. HARDING: One of the issues before your Honor is whether there is contributory infringement. Your Honor can decide, in view of that stipulation, whether there is or there is not.

THE COURT: I think there is.

MR. HARDING: That was certainly the intention in drawing the stipulation of both my friend and myself.

MR. OSTROLENK: I agree that that is so, that was true. I mean, we wanted to have the issue of law first settled.

THE COURT: Well, I decide against you on that issue. Now go ahead with the patent part.

DUFF ABRAMS, AN EXPERT WITNESS FOR PLAINTIFF:

DIRECT EXAMINATION.

DUFF ABRAMS, a resident of Woodside, Long Island, qualified as an expert on concrete and concrete structures including roadways.

Abrams graduated from the University of Illinois, College of Civil Engineering, in 1905 and obtained a degree of C. E. as a result of further work at the university in 1909. In the period 1905-1914 he conducted experimental studies of concrete at the University of Illinois and as a result he devoted himself in the period 1914-1924 to the carrying out of experimental studies of concrete and cement as professor in charge of the structural materials research laboratory, Lewis Institute, Chicago.

From 1924 to 1927 Abrams was director of research for the Portland Cement Association, Chicago, and from 1927 to 1931 was director of research for International Cement Corporation, New York City. Since 1931 he has been engaged as a consulting engineer, in New York City, on private investigations and reports on concrete and cement.

Abrams is a Fellow of the American Association for the Advancement of Science, a member of the American Society of Civil Engineers, American Society for Testing Materials, American Concrete Institute and Highway Research Board. He is a member of three committees of the American Society for Testing Mate-

rials, dealing with cement and concrete, and has been active in the work of the committees for the past fifteen to twenty years.

Abrams for many years was a member of the board of directors of the American Concrete Institute and was its president during the two years 1931 and 1932. Abrams has published about thirty papers on concrete and was awarded the Wason medal, American Institute, in 1909, and the Henry C. Turner gold medal, American Institute, for meritorious achievements in the concrete industry, in 1932.

He has had wide experience in concrete construction, notably on the Thebes Bridge and water filters for the University of Illinois, and has closely followed concrete highway construction since 1914.

Abrams, with reference to the problems and difficulties presented in the construction of concrete roads and their solution, prior to the summer of 1925, testified as follows:

A. Problems of concrete road construction fall under, I might say, four different headings. In the first place, you must produce a road slab which will sustain the loads of traffic, distribute those loads over the subgrade; secondly, you must produce the type of concrete which will withstand the ravages of weather, and you must produce a concrete which will present a smooth riding surface. You must present a concrete which will offer a maximum resistance to abrasion of wheels and traffic.

Q. 4. Now, how did they go about solving these problems prior to 1925, with more particular reference to the surface of the road?

A. The customary method was to mix the concrete, place it on the sub-grade to the required thickness, and finish it with either hand or machine methods, machine was just coming into use at that time. Then under the

heading of "curing," which meant the protection of the concrete against adverse temperature and hot winds, and so forth, that was rather neglected, because I think people didn't appreciate exactly the importance of it, and they had no precedent for just that sort of thing, a great expanse of concrete exposed to weather, sun, wind. The usual method of protecting concrete, however, at that time was placing canvas covering over the concrete above the concrete slab.

Q. 5. Placed away from it?

A. Entirely away from the slab. The specification generally stated about a foot above the slab. After the expiration of a few hours this covering would be removed and wet burlap placed on the slab which was supposedly kept wet.

Q. 6. What was the condition of the slab when the wet burlap was put on, in practice?

A. Hardened.

Q. 7. Would you say that it was set?

A. Certainly.

Q. 8. Sufficiently to support a substantial weight?

A. Yes.

Q. Will you explain to the Court what you mean by curing, what you mean by setting and what you mean by hardening?

A. Well, when cement and water mix together in a concrete mixture, a chemical reaction occurs between these two substances, which extends over a long period of time, maybe several months. However, the reactions are much more rapid and more significant during the first few hours. This chemical reaction exhibits itself in the gradual stiffening and later hardening of the concrete, and the engineers have come to use two separate terms for that purpose. They speak of the first process as setting up to the point where the initial reactions occur, and a certain degree of stiffness has been attained, and later the concrete is said to harden, that is

subsequent to the setting and extending over many days or months.

Q. 10. Now, the concrete, when it is first laid down, we are speaking about the roadway, can you describe its condition to us?

A. Well, naturally, it is very soft and offers no resistance whatever to any weight placed on it, or anything coming in contact with it—it would immediately sink of its own weight.

Q. 11. After it is placed it is then smoothed off and a surface is formed on it, still speaking of highways?

A. That's right.

Q. 12. Is there any special effort taken to produce any particular type of surface? That is, is any great care used in forming the surface?

A. As I say, considerable care is used because that is an extremely important factor to have a smooth surface to give smooth riding, and to enable the concrete to resist the abrasion of traffic to the best advantage.

Q. 13. Well, now, the surface having been smoothed off, is it or is it not important to avoid marring or damaging that surface?

A. It is very important, I should say at least the State highway engineers interpret it as being very important.

Q. 14. Well, after the concrete is finished, is the surface easily damaged, or is it resistant to damage?

A. It is very easily damaged.

Q. 15. Why is that?

A. Well, it may be damaged any number of different ways.

Q. 16. Why is it easily damaged?

A. Because it is soft.

Q. 17. Now, after it is laid and finished, it has, I understand, water present in it. What happens to it? That is, what occurs?

A. Well, if the water, if the concrete is not protected, the water immediately begins to evaporate due to the fact that the atmosphere is almost always much drier than the point at which evaporation begins.

Q. 18. Now, prior to 1925, did they take any steps to protect that concrete after it was finished, and if so, what was the condition of the concrete when they began to take steps to protect it?

A. There was very little attempt made to protect the concrete at that time, except the cases I mentioned where the canvas frame was placed above the concrete. Aside from that there was no attempt made to protect the concrete for I should say some hours after the finishing process was completed.

Q. 19. What was the condition of the concrete from the standpoint of set when efforts were made to protect it?

A. It was usually thoroughly set.

Q. 20. Was it hard?

A. Hard, yes.

Q. 21. What was the function of the protection then afforded to it?

A. Supposedly to prevent evaporation of water and to give the concrete the conditions which were conducive to the best hardening.

Q. 22. Now, with respect to the surface of the road which had been produced in general the way you have described, was it a good surface or bad surface, or what was the result obtained?

A. In many instances surface results were very bad because of the one thing, no doubt, because of the too rapid removal of the water from the concrete.

Q. 23. Well, now, do I understand correctly then that in accordance with your experience and learning, the methods used for protecting concrete highways prior to the summer of 1925, involved affording some protection to the concrete after the concrete had set and assumed a degree of hardness such as to support a considerable weight on it?

A. That is correct.

Q. 24. What was the most common method used?

A. The most common method used was placing burlap over the surface which was later wet with water over a period of two weeks to four weeks.

Q. 25. The burlap was laid on the surface of the concrete?

A. Laid on the surface of the concrete.

Q. 26. And the concrete you say was set when the burlap was applied?

A. That is true.

Q. 27. Was there any reason for having it set when the burlap was applied?

A. The principal reason being the desire to avoid marring the concrete. In fact, the specifications almost invariably state that burlap shall not be placed until the concrete has set to such extent that the surface will not be marred.

Abrams briefly described the process of the Hayden patent in suit as involving essentially the application of a continuous bituminous film on fresh unset concrete and pointed out that essentially according to the patent the bituminous film must be found on the surface when the concrete is still soft and wet.

Abrams first learned of the Hayden patent in suit in 1927 and gave his opinion of the advantages of the process, more particularly with reference to highways, as follows:

A. The advantage primarily is that the premature evaporation of water from the surface of the concrete at a critical period in its history is prevented.

Q. 36. What is that critical period?

A. During the first few hours of hydration, the period, that is, immediately following the mixing of the concrete.

Q. 37. With reference to the condition of the concrete, what is that period?

A. The concrete would still be soft during that period.

Q. 38. Well, with reference to whether the concrete is set or not?

A. It would be unset.

Q. 39. What disadvantages found in roadways prior to the summer of 1925 are cured by the operation of the Hayden process?

A. Considerable difficulty was encountered in roads at that time due to what is known as surface crazing or cracking. That means formation of what are sometimes referred to as mat cracks on the immediate surface of the concrete, and those cracks result from the shrinkage of the surface due to the loss of water and the mere fact that the concrete is shrunk at that point indicates that certain changes are going on which are likely to be disastrous as far as the surface resistance of the concrete is concerned.

Q. 40. How about the hydration of the cement during that period?

A. Well, the hydration of the cement will continue so long as water is present, but the moment the water is removed the hydration ceases.

Q. 41. Was the hydration of the cement adjacent to the surface of the roadway interrupted or continuous during the methods used for the protection or

rather lack of protection during the setting period prior to 1925?

A. It was interrupted by the premature drying of the surface and the attempt later to put water on to correct that.

Q. 42. Did that subsequent application of water correct the harm done during the setting period or not?

A. It does not.

Q. 43. And how did that show up in the final road in use?

A. It shows up by abrasion of the surface, producing a rough surface after the road has been under traffic for some time.

Q. 44. Was the surface concrete of such a road as good as what I may call the main body of the slab?

A. It was not; the surface was very much poorer than the main body of the concrete.

Q. 45. You spoke of surface crazing or cracking. Do you distinguish that crazing or surface cracking from what are commonly referred to as shrinkage cracks in fresh concrete?

A. It is of entirely different——

Q. 46. What is the difference?

A. It is a very different thing. The shrinkage cracks exhibit themselves by cracks entirely through the structure; that is what is generally referred to as shrinkage cracks, while these craze cracks are merely on the surface and extend only a few hundredths to an inch in, but nevertheless indicate a poor surface where you want the best one.

Q. 47. Now, do I understand correctly that that injury to the surface where the concrete was not protected until after it had set was irreparable by protection applied after setting?

A. I think protection applied after setting falls far short of correcting that difficulty.

Q. 48. Now, the application of the method of the patent in suit, what effect does that have?

A. In that case the bituminous film being applied to the surface while the concrete is still soft and in a wet condition prevents the removal of the water by evaporation and consequently surface concrete is harder and tenser than it would be otherwise, and is similar to the concrete throughout the depth of the slab.

Q. 49. I show you a drawing and ask you to point out to the Court in connection with the drawing the weak surface layer that you have described as present in concrete roads prior to 1925 and the effect of the practice of the process of the patent in suit. May I give you this one? (Plaintiff's Exhibit 3.)

A. You have indicated on the left-hand diagram a section of concrete road slab which is sound throughout and presenting a good wearing surface at exactly the point where the best type of concrete is needed. In the other diagram on the right of the drawing we have attempted to show the effect of premature removal of water from the surface, which produces a layer of somewhat indefinite depth of weak and friable concrete which is readily damaged or entirely removed by traffic.

With reference to water loss from concrete Abrams referred to the table and charts prepared from tests made by him, Plaintiff's Exhibits 4, 5 and 6, and explained as follows:

A. These tests were carried out on concrete mixture similar to that used in concrete road construction. In order to confine evaporation to the top surface only, as would be the case in a concrete road, we made the specimens in water-tight metal cans with the top only exposed. The top surface in a part of these speci-

mens received no covering whatever. In exactly parallel group a covering of asphaltic emulsion was applied in accordance with the Hayden patent. Specimens were made in depths of ¼-inch, ½-inch, 1 inch, 2 inches, 3 inches, 4 inches and 6½ inches. The specimens were exposed to a temperature between 85 and 100 degrees, simulating as best we could the normal summer temperature which generally prevails during the concrete road construction season. The purpose of making the concrete specimens of different depths was precisely to find out just what the rate of evaporation of water was on the immediate surface as compared with the evaporation from a concrete slab of considerable depth such as would be the case in a concrete road. The table marked Table 1 gives the details of all of these tests. Water loss by evaporation was determined by carefully weighing the specimens immediately after moulding and at intervals, 3 hours, 6 hours, 15 hours and so on, up to 14 days after concrete had been in place. The center columns in the table give the results of the water loss tests in grams as the total water loss in grams. In the right-hand portion of the table we have reduced those losses to percentages of the total mixing water in that particular group of specimens, so that by following down those columns in the right-hand group of figures we see the percentage lost by each depth of concrete, which is used in these tests. It will be noted that in the case of the one-fourth inch specimens—of course, that represents a very thin section of concrete—the water loss in the case of the specimens without any covering whatever, is 19.3 per cent. at the end of three hours, and that water loss gradually continued up to, until at fourteen days we got 64.3 per cent. of the total mixing water, which had been removed by evaporation. On the other hands, specimens which were

covered with an asphaltic emulsion in accordance with the Hayden patent showed losses at three hours of only six-tenths of 1 per cent. and at the end of fourteen days of 14.8 per cent. Those were the maximum percentage losses, of course, because that concrete was immediately exposed at the surface. However, as we come to the greater depths it will be seen that the loss, calculated on the basis of the total water in the concrete at that depth, becomes very much less. For example, in case of the 6½-inch depth which might be said to somewhat approximate the depth of a concrete slab, the water loss in the case of the specimens with no covering dropped to 2.7 per cent. at 3 hours and amounted to 18½ per cent. at 14 days, while in the case of the specimens of the same depth coated with the asphaltic emulsion the losses were one-half of 1 per cent. at 3 hours and amounted to 4.6 per cent. at 14 days. It will be noticed that the water losses in the specimens coated with asphaltic emulsion were not materially different, regardless of the depth of the concrete, while in the case of those without any covering the water loss of the thinner slabs was extremely high, indicating that the first water loss comes almost exclusively to the immediate surface, and until that water is substantially removed you get no evaporation below.

Q. 54. Now, is that, the results of those tests, shown on this chart marked "Mixing water loss by evaporation from concrete test blocks at different depths, showing a 3-hour curve?"

A. That is in this figure, or directly from the table which I just referred to.

Q. 55. And are those figures applied to the diagrammatical showing of section of concrete on the chart marked "Water loss through top surface of uncovered concrete?"

A. They are.

Q. 56. Is it your conclusion that the large water loss obtained with one-quarter inch specimens is typical of the water loss on the surface of a concrete highway one-quarter inch surface layer?

A. I think there is no doubt about it.

Q. 57. Is that water loss greater before the concrete is set or less?

A. It is very much greater during the period in which the concrete is still——

Q. 58. My question wasn't very correct. Is the water loss greater before the concrete is set than after it is set?

A. It is.

Q. 59. Now, am I correct that it is that water loss from the surface that gives you the bad crazed, weak surface that you have described in connection with roads prior to 1925?

A. You may get bad surfaces from other causes but the premature evaporation of the water is certainly one of the important factors in producing that condition.

Q. 60. And is it my understanding that you have found that the application of bituminous film to the concrete before it has set prevents that surface crazing and weakness which was noted prior to 1925?

A. It is my belief.

Abrams brought out that the Lechler German patent, Defendant's Exhibit 4, disclosed the application of a bituminous coating to pre-moulded concrete after removal of the moulds when the concrete was thoroughly set and partially hardened, and by painting the coating on the inside of the moulds before the concrete is placed. With reference to condition of the concrete when coating was applied after removal of moulds Abrams stated:

Q. 65. What would the condition of the concrete be when the moulds or forms are removed?

A. The concrete would be thoroughly set and probably be several days old.

Q. 66. Can you remove forms from unset concrete?

A. It would be a very hazardous thing to do in the case of a structure.

Q. 67. What would happen in a wall, for example?

A. Probably collapse of its own weight.

Q. 68. Go ahead.

A. Well, the next thing that Lechler points out is the method of applying a surface coating by painting the inside of the moulds before the concrete is placed.

Q. 69. What does he say with reference to that?

A. Well, he states that this bituminous coating is applied and the concrete is placed while the coating is still in a plastic condition, the presumption being apparently that the coating will adhere to the mould and when the mould is later removed produce a film on the surface of the concrete.

Q. 70. How would that work out in practice?

A. It would be entirely impractical to apply coating in that way.

Q. 71. Why?

A. Well, a number of reasons. In the first place, the moulds are generally set up entirely assembled, some time, generally several days, before the concrete is placed. The presence of reinforcing bars makes the inside of the moulds inaccessible and the attempt to coat the moulds would no doubt involve getting a lot of the bituminous material on the reinforcing bars, which would be very undesirable, and the attempt to place concrete against this soft film attached to the inside of the form without entirely dislodging the film due to tamping or spading, would be impractical, it

couldn't be done. The bituminous material would be rubbed off, mixed with the concrete and the entire procedure, it seems to me, is entirely impractical.

and with respect to application of coating by painting on the inside of moulds before placing the concrete, he stated with reference to the chart Exhibit 7:

A. This chart was made up from a typical wall which is found in one of the most popular textbooks on this subject. It represents in general the type of wall which would be built for retaining an earth fill. We have indicated the position of the earth fill on the diagram. The chart shows forms in place and the cross-section of the concrete as well as the location of the reinforcing bars, which are made of steel. I stated a moment ago that an attempt to paint the inside of this form without dabbing the material all over the reinforcing bars would be an extremely difficult operation. In the first place, in many instances, the clearances are not very great, scarcely room for a man to get in there, and the process of placing the concrete, which naturally begins at the bottom and works toward the top, and the spading of the fresh concrete around the reinforcing bars and into these corners, would entirely remove any soft film which might previously be placed on the surface of the form.

Q. 73. What would become of it if there was a quantity on the surface of the form?

A. Simply be mixed up with the concrete and be rather a damage to the concrete and do no good as far as the forms are concerned.

Abrams stated that the disclosure of the Lechler patent would not suggest the Hayden process and compared the problems presented by structures such as walls and those presented by highways as follows:

A. The problems are entirely different. In the first place, in a wall the mass of concrete is very large as compared with the exposed surfaces, whereas in a concrete road slab just the opposite condition exists; that is, a very large surface exposed as compared with the volume of the concrete.

Q. 77. Is the surface condition of a wall of any material importance?

A. Very little.

Q. 78. Is a wall ever subject to any abrasion?

A. Scarcely ever.

Q. 79. Can you find anything in the Lechler patent that suggests a problem that was presented to the patentee of the patent in suit with respect to the particular subject of highway construction?

A. I find nothing whatever.

Abrams pointed out that the Lechler patent did not make any reference whatever to the use of bituminous or asphalt emulsion for the formation of a coating, or any mention of application of a coating before the concrete had set.

Abrams brought out that the Hayden patent had a considerable influence on the art in calling to the attention of highway engineers the possibility of protecting the concrete at an earlier period and that it attracted a great deal of attention in view of the better results obtained.

Cross-Examination.

On cross-examination Abrams discussed the time involved in the chemical action taking place after the mixing of concrete with reference to "set", "fresh", "curing" and "hardening":

XQ. 93. Mr. Abrams, you spoke in your testimony of chemical action which you say took place after the

concrete was mixed. How long did that chemical action last, did you say?

A. It continues for several months.

XQ. 94. And is that known as the curing period?

A. It might loosely be referred to—the entire period of hydration is the curing period.

XQ. 95. What do you understand the curing period to be, exactly?

A. I should say that it more specifically refers to the early history of the concrete where experience has shown that protection from evaporation and low temperatures and so on are important.

XQ. 96. Well, precisely how long is that curing period that you have referred to?

A. It might be different at different temperatures and conditions. I don't believe you can set any exact limit.

XQ. 97. Would it be twenty minutes, two hours, two days, two weeks?

A. I would say it would range somewhere between three days and thirty days.

XQ. 98. You talked about the period when the concrete is set; how long does it take concrete to set?

A. That again varies at temperature and so on; sometimes it will set within say thirty minutes, other times it may take ten or twelve hours.

XQ. 99. You used the term "hardening". Where in the literature do you find such a term in connection with curing concrete?

A. It is a very common term, used in any literature, I should say, that has anything to do with concrete.

XQ. 100. Can you refer to some specific literature on that point?

A. I have nothing here. I think I can find you plenty of references in a few minutes.

XQ. 101. If you apply an asphalt emulsion two hours after the concrete has been laid, will you assist in the curing of the concrete?

A. It will assist but not to the same extent as if applied at an earlier period.

XQ. 102. Then it is true that applying asphalt emulsion before it is cured will help cure the concrete—will prevent hydration; is that correct?

A. No, it doesn't prevent hydration.

XQ. 103. Well, how soon must it definitely be applied so that it will prevent hydration?

A. I don't understand the use of your terms.

XQ. 104. How soon—you have used the term "hydration", you have used the term "the application of the emulsion assisting in the curing of the concrete". Now, I want to know how soon it must be applied definitely so as to act in the manner described in the Hayden patent?

A. Well, the sooner it is applied the more efficient it is. I am sorry, I don't understand your question.

XQ. 105. Well, how soon, as soon as the concrete has been made, within say half an hour after it has been made?

A. It generally is placed within a very few minutes.

XQ. 106. The emulsion is placed within a few minutes?

A. That's right.

XQ. 107. After the concrete has been laid?

A. That's right.

XQ. 108. And that is your understanding of fresh concrete?

A. That concrete is fresh.

XQ. 109. That concrete is also soft?

A. It is.

XQ. 110. The concrete is also moist?

A. Yes.

Discussing the tests made as a basis for Exhibits 3, 4 and 6, Abrams testified as follows:

XQ. 111. In these tests that you have here, these exhibits—now, in Plaintiff's Exhibit No. 4, how soon was the emulsion applied after it was laid, after the concrete was laid?

A. I would say about fifteen to twenty minutes.

XQ. 112. The concrete was still soft?

A. The concrete was still soft.

XQ. 113. And was moist?

A. It was.

XQ. 114. I am handing you Plaintiff's Exhibit 3. How were those photographs made? Are they photographs?

A. These are not photographs, they are simply an effort to put on paper what we consider the typical behavior in the two cases. They are not photographs.

XQ. 115. So that they are merely your own notion of what happens, not a picture of something that actually happened?

A. That is correct. The tests themselves showed exactly what did happen.

XQ. 116. This Plaintiff's Exhibit 6, that is also merely your notion of what happens?

A. No, sir. The principal purpose there was to be able to place the actual values of water loss by evaporation on the chart, simply give a visual picture of the actual performance at different depths.

XQ. 117. Well, is this a picture of a cross-section of concrete?

A. That is not; that is simply a draftsman's conventional method of representing concrete.

XQ. 118. Then again it is merely an illustration of what your notion is of what happens?

A. I have explained that my purpose in making this diagram was to place on here the actual water loss. That is not a notion; that actually occurs.

XQ. 119. Well, I mean when you say it actually occurred, did you draw this from a cross-section of concrete that was under a microscope, something of that nature?

A. That is simply a draftsman's conventional method of indicating a cross-section of concrete. The important thing in that diagram are these figures here, which are not my notion by any means.

With reference to the Lechler patent, Defendant's Exhibit 4, Abrams analyzed as follows:

XQ. 128. Do you find anything in the first or second paragraphs of your translation any mention of a concrete wall?

A. I do not.

XQ. 129. Does it refer to the curing of concrete?

A. I take it that this first paragraph and by inference the second paragraph refers to coating of premoulded objects which can be, after they are formed or removed, dipped in the bituminous material.

XQ. 130. Well, will you point out where exactly in those two paragraphs there is any mention of a mould?

A. Well, this——

XQ. 131. Please take the question.

A. I do not find any such reference in the first two paragraphs. However, the third paragraph——

XQ. 132. I think that you ought to stop there because we will come to that.

MR. HARDING: Well, let him finish his answer. He is testifying as an expert.

THE COURT: You cannot tell him to stop there; I never heard of such a thing.

MR. OSTROLENK: Well, the question was as to the first two paragraphs and he has answered that.

However, if your Honor wishes him to he can go on.

XQ. 133. Do these two paragraphs describe a process for curing concrete then without regard to any moulds or frames?

A. The first paragraph appears to be a very general assertion; the second paragraph refers to fresh concrete, which as I stated before is anything up to the time the concrete is ready for service, maybe a month. Generally it is meant—— (interrupted).

XQ. 134. In line 4 of the first paragraph does it say that the concrete is moist?

A. It certainly says so, yes, sir.

XQ. 135. And have you testified that fresh laid concrete is concrete which is moist?

A. Many other types of concrete is moist also.

XQ. 136. Concrete before it has been set is moist, is that correct?

A. That is correct.

XQ. 137. Then this refers to concrete before it has been set?

A. It doesn't say so.

XQ. 138. Do you find anything in the second paragraph, which describes the prevention of evaporation of water from this concrete?

A. It is about the application to fresh concrete, and as I stated a moment ago that may be anything up to a month, still referred to as fresh concrete.

XQ. 139. So whenever you have a reference to fresh concrete, that may be up to a month, is that correct?

A. It may, depending on the context of the language. You cannot say——

XQ. 140. Well, as this language is here, this would make you think it would be any period up to a month after the concrete has been laid, is that correct?

A. It might be such a period.

Abrams brought out that the dates shown by Exhibits 4, 5 and 6 were taken from actual concrete blocks.

RE-DIRECT EXAMINATION.

Abrams stated that the illustration in connection with inadequate curing to which he had pointed with reference to Plaintiff's Exhibit 3, showed diagrammatically concrete which had had no curing at all and that the concrete would have undergone the same deterioration had the concrete been treated by the application of burlap and sprinkling with water after the concrete had set, and continued:

RDQ. 159. Would the surface have been materially improved—now I am speaking of the burlap curing.

A. I think it would not be materially improved because the damage due to the premature removal of the water is done at an early period and placing burlap later would not remedy that situation.

RDQ. 160. Am I correct that the surface deterioration which is illustrated arises during the pre-setting period as compared with after the concrete has set?

A. That is the most critical period and lack of cure then is reflected in a poor pavement.

RDQ. 161. Will the application of burlap or other effective means after the concrete has set recover the loss which occurred prior to the setting?

A. Only partially and very slightly, I should say, in most instances.

With reference to prior art methods Abrams brought out that burlap was applied after the concrete was set and was permitted to remain until the next day. After removing the burlap hay or straw was applied to the concrete and compared the procedure with that of the patent in suit as follows:

RDQ. 163. Was it necessary to sprinkle that hay or straw or earth?

A. Yes.

RDQ. 164. How long did that remain on?

A. Periods of ten days to three weeks.

RDQ. 165. During which time it was necessary to sprinkle it occasionally?

A. Supposed to be sprinkled continuously. That is the way the specifications generally read, "keep wet."

RDQ. 166. Having applied the bituminous coating according to the method of the patent in suit, what, if anything, is it necessary to do thereafter in connection with protection of the concrete?

A. Nothing whatever; the bituminous coating serves the purpose of protecting it.

RDQ. 167. Would you from your experience, assuming that you had no knowledge of the successful operation of the method of this patent, would you have believed that a bituminous film coating could be formed on concrete before it was set?

A. Well, I did not believe it until I had seen it and tried it.

RDQ. 168. That is all.

HAROLD C. HAYDEN, A WITNESS FOR PLAINTIFF.

HAYDEN, the patentee of the patent in suit, resides in Sewaren, N. J., and is in the employ of The Barber Asphalt Company, the plaintiff, as a research chemist.

Hayden brought out the problem presented to him prior to making the invention of the patent in suit, the nature of the invention and its distinction from the prior art, testifying:

A. In our contact with the paving art we studied the type of deterioration that occurred in concrete construction, concrete road slabs. We attempted to deter-

mine the cause of the spalling and rapid abrasion which took place in such slabs to their ultimate destruction. We found as a result of our study of the matter that apparently the cause of the weakness in the surface of the concrete was due to the inadequate hydration of the concrete and the Portland cement. It seemed from our study that the methods of curing which were available which were practiced at the time, were entirely inadequate to give the anticipated strength to the surface layer of concrete slab, the layer which was subject to abrasion of traffic, the impacts of traffic.

Q. 5. What type of cure or treatment of the concrete was being carried out when you were addressing that problem that you have given us?

A. The most prevalent method of curing was the application of burlap after the concrete had set sufficiently to permit of its application without marring followed after a period of say twenty-four hours by the application of wet earth or wet hay or straw.

Q. 6. What was your solution of the problem?

A. The solution of the problem involved the application of an adherent bituminous film to the surface of the concrete immediately after the surface was finished.

Q. 7. What was the condition of the concrete at the time when you wished to apply the film?

A. The concrete at the time of finishing is exceedingly soft and tender and can be readily shaped by any tool that is used in the finishing process. The same condition prevails at the time that the bituminous film is applied.

Q. 8. Is there anything critical about the application of the bituminous film at that time?

A. We found that the period which intervened between the time of finishing and the time at which the burlap was applied was exceedingly critical in the development of strength in the surface of the slab.

Q. 9. Is that period especially critical with reference to the surface?

A. Especially critical with reference to the surface, although the strength of the entire slab is to some extent influenced by the curing method used.

Q. 10. How did you originally go about forming that bituminous film on the surface of the freshly finished concrete?

A. We resorted to various expedients and determined that it would be impossible to apply a bituminous film of this nature early enough to prevent the objectionable dehydration, surface dehydration, by means of a brush or similar tool; squeegeeing would be impossible because the surface is so tender at that time as to make such application impossible. We finally determined that a spray was the best means. We found, however, that in spraying the bituminous material great care must be exercised to atomize the curing medium in order to avoid marring the concrete because at this time the concrete is so soft.

Q. 11. Do I understand, Mr. Hayden, that you want to keep the water from going out of the concrete; is that the idea?

A. Yes, your Honor.

Q. 12. Why is that?

A. The strength of the concrete is entirely dependent upon the hydration of the Portland cement that is used in the preparation of the mixture, and in order to get adequate hydration you must have adequate water. Now, there is plenty of water in the mixture to adequately cure the concrete.

Q. 13. Why do you use the word "cure"? It seems a curious word.

A. Adequately hydrate the Portland cement, I might say.

Q. 14. You mean adequately keep moistening it?

A. No, it is a type of crystallization or interaction between the water and the Portland cement. Now, if there is not sufficient water there we don't develop the anticipated strength in the concrete. That is particularly true at the surface on the surface film, surface layer.

Q. 15. And the purpose of this emulsion covering is just to keep the water in, isn't it, keep it from evaporating?

A. The function of the film is to prevent evaporation of the mixing water.

THE COURT: All right.

By MR. HARDING:

Q. 16. Mr. Hayden, in the prior art, that is prior to your invention, it was customary, was it not, after the concrete had set and become hard so that it would not be marred, to supply water to the concrete by placing burlap on the surface of it and sprinkling the burlap?

A. That's right.

Q. 17. Prior to your invention, however, as I understand, there was no addition of water to, nor protection against, evaporation of water from the concrete prior to its set?

A. That is correct. During the critical period there was no provision made for replacing such water as might be lost through evaporation.

By THE COURT:

Q. 18. What causes concrete to set, Mr. Hayden, what is the chemical process of setting?

A. Well, it is perhaps best described as crystallization, although the ingredients of concrete are most complex and the crystalline structure—it is a moot question, as a matter of fact; it is a most intricate system of dry ingredients of the Portland cement, which upon contact with water crystallize and swell and

harden and thus produce a system which is resistant to loads.

Q. 19. Well, does the setting depend on anything except the internal process?

A. The setting is entirely due to the hydration of the Portland cement, of the ingredient—this Portland cement (interrupted)——

Q. 20. Well, supposing I have some Portland cement in say a tray and pour water on it, that will set, will it?

A. In the course of——

Q. 21. Time?

A. Time; it will set and become hard. That would be neat cement.

Q. 22. Nothing else in it. Is there any definite period of time?

A. The period of time is largely dependent upon the temperature at which the experiment is conducted.

Q. 23. If it is a high temperature does it do it sooner?

A. It sets somewhat more rapidly at higher temperature, yes, sir.

Q. 24. If you raise the temperature very high would it set even more rapidly?

A. There are limitations; it wouldn't be wise to raise the temperature above the boiling point of water.

Q. 25. In case that would have some effect on the water?

A. You would dissipate the water.

THE COURT: I see.

The first medium which Hayden used to form the film or coating on concrete was bituminous emulsion, which, and the use of which, is described as follows:

A. A bituminous emulsion is a dispersion of bitumen in water by means of a protective colloid such as soap, for instance. It is possible to disperse the bitu-

men in minute particles, microscopic in size, which dispersion is permanent; it remains in a dispersed condition a long period of time without any coagulation and the emulsion may subsequently be broken and caused to form films by various means.

Q. 28. Your original concept, despite your original use of emulsion for the formation of this film, included the use of other bituminous film forming materials, did it not?

A. Yes, we studied paint-like materials, solutions of bitumen in volatile solvents, for example.

Q. 29. Now, does the bituminous emulsion have any particular advantage over other paint-like materials?

A. In our opinion it does.

Q. 30. Will you explain how the bituminous emulsion affects the formation of a film after it is sprayed on the surface of the wet concrete and how it is advantageous, for example, over a solution of bitumen in an oil of some kind?

A. The bituminous emulsion is usually made with a soap as the protective colloid. This soap is a chemical compound which is constituted by the combination of an organic acid such as oleic acid or abietic acid with sodium; in other words, the soap might be sodium oleate, that would be the simplest type of soap. When this emulsion system is brought in contact with the surface of the concrete it encounters calcium ions which are in solution in the mixing water and calcium, which is actually in the ingredients of the concrete. When the soap of the emulsion makes contact with this calcium or other earth metal salts, ions, the soap is converted into an insoluble soap. To illustrate the difference between the soluble and insoluble soap, we might refer to the ring in the bathtub. The soap you see in the bathtube is the soluble sodium oleate essentially.

You bring it in contact with the calcium salts in the water and it is converted into an insoluble calcium soap.

Q. 31. How is that conversion effected?

A. The chemical reactions tend to the formation of insoluble salts. They prefer to go in that direction.

Q. 32. Well, to simplify it, Mr. Hayden, you said that the soap of the emulsion contacting with the calcium or calcium ions in the mixing water of the cement caused the formation of an insoluble soap. Now, will you explain to us how that insoluble soap is formed?

A. Explain how the insoluble——

Q. 33. What is the chemistry of it?

A. Well, it is merely an interaction between calcium hydroxide we will say, and sodium oleate. The reaction goes towards the formation of the insoluble soap and results in its formation.

Q. 34. What is the insoluble soap that is formed?

A. Calcium oleate.

Q. 35. Well, we have sodium oleate and we have calcium, calcium hydroxide. Now, how does it come about that we get calcium oleate, what then becomes of the sodium?

A. The sodium is present momentarily or temporarily as sodium hydroxide, which later is converted into sodium carbonate by the CO_2 of the water.

Q. 36. Well, then, am I correct that the sodium oleate is dissociated or broken down and that the acid, the oleic acid and the sodium oleate combines with the calcium and forms calcium oleate, which is insoluble?

A. That is true.

Q. 37. Now, will you proceed to go ahead?

A. Now, I was describing why the emulsion formed a better curing medium, constituted a better curing medium than other types of bituminous materials. In the application of the emulsion, the emulsion is broken

to form an impervious film immediately upon contact with the calcium in the concrete. If you apply an emulsion of this character to some type of surface that does not contain calcium or other earth metal salts, the only tendency for the formation of a bituminous film, impervious bituminous film would be the evaporation of the water. That would leave a film which would be impervious. But in the case of concrete, when you bring the emulsion in contact with the surface of the wet concrete, you have not only evaporation but also this flocculation or chemical reaction which causes the film formation.

Q. 38. Now, in a word that is caused, is it not, by the fact that the soap, the sodium oleate, for example, which is the emulsifying agent or dispersing agent for the asphalt, is converted into an insoluble soap and hence thrown out of solution in the water and hence there is no emulsifying agent, is that correct?

A. That is true.

Q. 39. Now, when that occurs what happens to the dispersed asphalt?

A. The dispersed asphalt coagulates, the particles of the dispersed asphalt are coagulated by this chemical reaction to form continuous impervious film.

Q. 40. Now, what if any, function does the insoluble calcium oleate, which has been formed, perform?

A. One of the added features of the application of emulsion is that we get a more adherent film.

Q. 41. How does that come about?

A. Because of the formation of this insoluble calcium oleate which has a tendency to become oriented between the film of bitumen, which is formed, and the surface of the concrete. This orientation of the insoluble calcium oleate takes place because of the affinity of the oleic acid radical for the asphalt. The oleic acid radical would tend to go into solution in the asphalt

in the bitumen and thus set all of these molecules of calcium oleate in an orderly fashion with the oleic acid in contact with the bitumen and the calcium ion in contact with the Portland cement concrete.

Q. 42. Now, I show you a sketch which I will ask you to have marked for identification as Plaintiff's Exhibit P-8.

(Marked Exhibit P-8 for identification.)

Q. 42. (Continuing.) And ask you if you will very briefly explain the theory that you have just advanced to the Court in reference to that sketch. Just indicate on the sketch what the various parts are.

A. This is a conventionalized sketch portraying the phenomena that I just described, namely, the orientation of calcium oleate molecules to the surface of the bitumen in a systematic fashion, affording a better bond between the bituminous film and the concrete than would otherwise be afforded.

Q. 43. Do the so-called on the sketch acid radicals adhere to the bituminous film?

A. The acid radical tends to go into solution in the bituminous film.

Q. 44. To become a part of the film?

A. To become a part of the film. There is a tendency in that direction.

Q. 45. Do the so-called metallic radicals tend to do the same thing with the concrete?

A. Some of the calcium radicals may be a part of the Portland cement concrete structure, as a matter of fact.

Q. 46. Then the two taken together act as an adhering medium, bonding or binding?

A. Yes, sir. That facilitates the bond between the concrete and the bituminous film.

Hayden pointed out that sufficient water must be present during the setting of concrete and that if sufficient water is not present the strength of the concrete is lowered. Loss of strength is particularly noticeable on roadways at the surface where most of the water loss takes place and results in spalling and surface weakness. Loss of strength cannot be remedied by the addition of water to concrete after it has set.

Hayden is familiar with the commercialization of the patent in suit and its effect on the art and in respect thereto testified as follows:

Q. 53. Has the method been adopted as standard in any states for highway construction.

A. It has.

Q. 54. Roughly speaking, how many states, if you know, have adopted it?

A. I would say some seven or eight states that I am familiar with.

Q. 55. And some seven or eight states have adopted it as a standard specification?

A. As an alternative specification to the existent methods of curing.

Q. 56. Do you know whether any change occurred in the methods of curing, and more particularly the burlap and sprinkling method, after the introduction of your method into use?

A. As we study the methods of cure prior to our invention we find them as stated inadequate. We feel that there has been a considerable improvement in curing methods in general as a result of the investigations which were incident to the exploitation of our invention.

Q. 57. Has any particular change taken place in the burlap and sprinkling method as a result of the exploitation of your invention?

A. Greater care is being taken in the application of burlap to see that it is applied as soon as possible, as soon as the inspector will permit, in order to obtain adequate strength and some degree of protection during this critical period.

Q. 58. Is it possible to apply burlap without marring the surface within the critical and essential period in which you apply your bituminous film?

A. Scarcely. There has been improvement since my invention came to issue but it is scarcely possible to apply—it is impossible, as a matter of fact, to apply burlap as early as it is possible to apply this bituminous film.

Q. 59. Then do I understand——

A. On account of marring the surface. You can readily see that if the bituminous film is applied as an atomized spray that it may be applied without marring at once as soon as the finisher has completed his task, whereas in the application of burlap the inspectors will not permit the application of the burlap until the surface has assumed sufficient strength to resist the very slight abrasion effect of the burlap during its application.

Q. 60. Is the method of this patent approved in the State of New Jersey for highway construction?

A. It is.

Q. 61. Mr. Hayden, if the prior procedure involving burlaping and applying hay, as testified to by Mr. Abrams, is not efficiently carried out with respect to sprinkling, what is the result on the concrete?

A. Loss of strength, especially at the surface.

Q. 62. And that occurs why?

A. Inadequate hydration.

Q. 63. Is it necessary after the application of the bituminous film in accordance with the method of your patent to do anything else with respect to protection or conditions of water?

A. One of the particular merits of our invention seems to be the positive indication of adequate application, the contrast in color between the bituminous film and the gray surface of the concrete permits the inspector to determine at a glance that the surface is entirely covered and he needs worry about it no more during the curing period.

Q. 64. Is it necessary to do anything at all after you cover the surface with the bituminous film?

A. The road is barricaded but otherwise nothing is done.

Q. 65. Is it necessary to add any water to it, to sprinkle it?

A. No water could get to the concrete if applied. The film is impervious.

Q. 66. Is it necessary to put any hay or straw over it?

A. It is not.

CROSS-EXAMINATION.

Hayden stated that concrete would set anywhere from ten minutes to several days, depending upon atmospheric conditions, and that concrete was still fresh until strong enough to serve the purpose for which it was designed—in the case of a road slab, until it would support the stresses of traffic.

He brought out that bituminous emulsions had been in use for thirty, perhaps forty, years and had been used by road contractors for some twenty-five or thirty years. And that only a small percentage of the amount of emulsion bought by contractors was used for curing concrete.

Hayden stated that the figure Plaintiff's Exhibit 8 was not made from an actual slab of concrete and that "cold repair cement" referred to in his patent, page 2, lines 11-12, was of the general type used in the curing of concrete.

With respect to the importance of preventing loss of water from concrete Hayden testified as follows:

XQ. 79. You have mentioned in your direct examination that the important purpose of this process is to prevent the loss of water because that is what prevents proper crystallization; is that correct?

A. Quite right.

XQ. 80. Would it be equally harmful perchance if there was much water present?

A. The present trend in concrete construction is to minimize the amount of water, but we will always have adequate water for the complete hydration of Portland cement in any mix, regardless of how dry it may be so long as it can be placed.

XQ. 81. But suppose there were more than enough water present?

A. Excesses of water would certainly impair the strength of the concrete.

XQ. 82. When the emulsion breaks, as you have described, and the metallic radicals form as illustrated in this Exhibit 8, is there some water which also separates from the emulsion?

A. Yes.

XQ. 83. And what happens to that water?

A. Part of it is added to the mixing water and the remainder that happens to be present on the surface is evaporated.

XQ. 84. Well, does the part which mixes with the mixing water do any harm in that it increases the volume of water present?

A. As I mentioned a moment ago, the amount of bituminous emulsion used for this purpose is exceedingly small. We cover some ten square yards with a gallon of the emulsion. Obviously, it would do no harm, it wouldn't change the water content of the concrete perceptibly.

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Hayden stated that various States had adopted the patented method of curing concrete around 1927 to 1929, that New Jersey was one of the first to adopt it and the The Barber Asphalt Company does not do commercial road contracting in competition with road contractors.

Under examination by the Court Hayden testified as follows:

Q. 88. Did you know anything about this German patent, Mr. Hayden?

A. Not at the time of filing, your Honor.

Q. 89. When did you learn about it?

A. Around 1927 or 1928.

Q. 90. Who brought it to your attention?

A. It was discovered in an effort to bust my patent, as I understand it.

Q. 91. By whom?

A. I don't recall.

MR. HARDING: I didn't hear the question.

Q. 92. By whom?

A. Who found the Lechler patent?

MR. HARDING: I don't know. I don't know. This patent created considerable interest and a great many people searched against it, and my understanding is that a searcher for some interest located it in the Patent Office in connection with the search, but exactly who it was I don't know.

Q. 93. Do I understand that there had been any of this coating with bituminous film—to what extent had it been coated with asphalt emulsion before you did it?

A. Concrete pavements had been protected by the application of bituminous films long before I conceived of this application for curing purposes, yes, sir.

Q. 94. What stage in their construction?

A. Well, the application was invariably made after the concrete was sufficiently hard to permit the application with the usual equipment such as a brush or a squeegee or something of that sort that would throw perhaps—run a car over the surface, and with a sprinkler on the back of it apply the film.

Q. 95. Well, was that for the same purpose, to keep the water in?

A. I don't believe that was a prevalent practice, your Honor, although there was some application of bituminous films rather early.

Q. 96. Why were they made? That's the only thing I am trying to get at. Why were those applications made? Why was the film applied?

A. In many cases it was applied to afford a bond between the concrete foundation and the bituminous wearing surface that was applied afterwards.

Q. 97. Oh, you mean it had nothing to do with the concrete?

A. Well, it probably had an effect in conserving some of the water that may have been in there, but they couldn't apply such a film—these were hot asphalts usually, hot moulten asphalts; they couldn't apply such a film to a very wet or green surface.

THE COURT: That's all, sir. Thank you.

GLOSTER P. HEVENOR, A WITNESS FOR PLAINTIFF.

DIRECT EXAMINATION.

GLOSTER P. HEVENOR, a resident of Malba, Long Island, vice-president of Johnson-March Corporation, was educated at Ohio Northwestern University and has had twenty-five years experience as an engineer,

having been associated with the New York State Highway Department, with the City of Rochester as a designing engineer, as a consulting engineer and with the Johnson-March Corporation, which is a producer of curing materials.

Hevenor brought out that Johnson-March Corporation both sold material for curing concrete and cured concrete, under license, under the patent in suit, from The Barber Asphalt Company, the plaintiff, having bought out the assets of the McEverlast Company, a former licensee, some three years ago. Continuing Hevenor testified:

Q. 8. Does Johnson-March Company, to your knowledge, have any predecessors?

A. Yes, the McEverlast Company.

Q. 9. Is that company still in existence or not?

A. No, sir, the Johnson-March Company bought the assets of the McEverlast Company about three years ago.

Q. 10. Do you have knowledge of the records of the McEverlast Company?

A. In a general way, yes, sir.

Q. 11. Do you know how long that company was in existence?

A. It started either late in 1927 or early in 1928.

Q. 12. Do you know whether that company had a license from The Barber Asphalt Company under the patent in suit here?

A. Yes, sir, they did.

Q. 13. Do you know whether or not they operated under it?

A. Yes, sir, they did.

Q. 14. Did they operate to cure concrete or to sell material for concrete?

A. They did both.

Q. 15. Have you examined the records of the McEverlast Company in connection with the records of your own company to determine approximately how much concrete, more particularly concrete highways, were cured by your company and its predecessor under the licenses under which they operate?

A. I have. The total amount is approximately 20,000,000 square yards of the two companies.

Q. 16. That is 20,000,000 square yards of highway?

A. Yes, sir.

Hevenor stated that he had had extensive investigation and tests made at Columbia University to determine whether curing with bituminous film was superior to the usual methods. He described the investigation as follows:

A. We made a long series of tests on the compressive strength and the resistance to abrasion of concrete cured under different methods, that is, by using bituminous cures, the conventional moist hay cure, burlap, etc. I cannot go into detail on those tests without figures here. I can give you the summation of it.

Q. 19. All we want is just results in general.

A. There were some thousands of tests.

Q. 20. Well, just the results in general.

A. In general, bituminous cure as compared with wet burlap or hay cure showed an effect of about 15 per cent. increased compressive strength.

Q. 21. What, if any, results did you get with respect to the surface?

A. Following those tests we went into a different method of testing by splitting concrete into layers to investigate the effects of curing throughout the mass, and we found that the same concrete in which we found the approximate 15 per cent. differentiation on the

entire mass showed a differentiation between improper curing and what we call proper curing, about 40 per cent. on the top two inches. The effect decreased as you went into the mass, of course, till the bottom, lowest concrete, was approximately the same.

Q. 22. Do I understand then that you found the increase in the strength of the surface layer of concrete cured with an application of bituminous film to be 40 per cent. greater than that cured by other methods?

A. Approximately that is what it averaged.

Hevenor continuing stated that Johnson-March Corporation extends its operations in the curing of concrete by the method of the patent in suit over the entire United States and further, that to his knowledge from the records of the McEverlast Company, the operations of that company under the patent in suit covered the same field.

Hevenor defined cut-back as an all-petroleum material rather than a mixture of asphalt and water, as in the case of an emulsion and stated that the tests with reference to which he testified were carried out under his personal direction and that in connection with the tests the concrete was soft, in a plastic state, unset, when the bituminous film was formed.

Cross-Examination.

Hevenor under cross-examination pointed out that Johnson-March Corporation had a license under the patent in suit for the curing of concrete with use of cut-back asphalt, but did not have a license for curing concrete with the use of asphalt emulsions.

Hevenor stated that Johnson-March Corporation carried out the process of the patent in suit under the license from The Barber Asphalt Company using cut-

back and that cut-back was very satisfactory for curing concrete, in his opinion better than emulsion.

Hevenor testified that royalty was paid to The Barber Asphalt Company by Johnson-March Corporation under the license in the form of the purchase of raw materials from The Barber Asphalt Company.

Re-Direct Examination.

On re-direct examination Hevenor stated that The Barber Asphalt Company manufactured the cut-back material used by Johnson-March Corporation for curing concrete in the eastern part of the country and that Johnson-March Corporation bought Trinidad asphalt from The Barber Asphalt Company.

Re-Cross-Examination.

On re-cross-examination Hevenor stated that the cut-backs bought from The Barber Asphalt Company for use in the eastern part of the country were prepared by The Barber Asphalt Company to Johnson-March Corporation specifications and that for use in the western part of the country Johnson-March made its own cut-backs, buying Trinidad or Bermudez asphalt used from The Barber Asphalt Company.

FRED H. UFFMANN, witness, identified himself as a resident of Abington Township, Pennsylvania, and as shipping manager of The Barber Asphalt Company, a position which he has held for ten years.

Uffmann stated that he was familiar with the products of The Barber Asphalt Company and with the shipping records of the company, that the company sold a material for the particular purpose of curing concrete under the name "Curcrete", which product,

an emulsified asphalt, is not sold under the name "Curcrete" for any other purpose.

Uffmann stated that the sale of "Curcrete" for the curing of concrete was commenced by The Barber Asphalt Company in 1928, since which time, as determined by him from the shipping records of the company under his control and custody, over three million gallons—exactly 3,195,385 gallons, had been sold.

Uffmann stated that the Curcrete product was sold specifically for curing concrete under the Hayden patent in suit.

CROSS-EXAMINATION.

Uffmann under cross-examination reiterated that the material shipped as Curcrete was sold only for use in curing concrete under the Hayden patent in suit. He was unable to say whether the product was used for other purposes by road contractors after they purchased it.

RE-DIRECT EXAMINATION.

Uffmann stated that he knew of his own knowledge that The Barber Asphalt Company granted a license to Johnson-March Company under the patent in suit, stating that he had seen the license.

S. MICHAEL PINELES, A WITNESS FOR DEFENDANTS.

DIRECT EXAMINATION.

PINELES on direct examination testified that he graduated from the University of Vienna in 1920 as an electrical engineer, that he had been employed for two years as an electrical engineer by the Westinghouse Company at East Pittsburgh, Pa., and that presently he was a patent attorney.

Pineles stated that he was a member of the bar of Pennsylvania and Illinois and that he had practiced law in Chicago.

Under examination by the Court, Pineles stated that he had studied English himself in Europe and that he had studied in this country since being here. He stated that he had done translating from German for the Westinghouse Company and admitted that he never took any lessons in English.

Continuing, Pineles stated that he had graduated in law from Duquesne University in Pittsburgh and that he had been involved in quite a number of litigations involving patents which were all conducted in English.

As a result of discussion between the Court and counsel, it was developed that with respect to translation of the German patent to Lechler, Defendants' Exhibit 4, there was dispute as to the translation of the word "Erhärtung" appearing in the patent. It was pointed out by counsel for plaintiff that defendants translated "Erhärtung" in the title of the patent as "curing", whereas plaintiff contended that the word was properly translated as "hardening". A further dispute appeared in translation of the word "schwindrissbildung", defendants translating the word as "hair cracking" and plaintiff contending the correct translation to be "shrinkage cracks".

Use of the word "abgebunden", meaning setting or set in the German patent in distinction to the word "Erhärtung" meaning "hardening", also used in the German patent, is pointed out by counsel for plaintiff. Pineles continued with discussion as follows:

> THE WITNESS: —because abbinden means what is called here setting, and this book, for instance, describes the two periods of abbinden and calls it abbinden, means the same thing as setting

here from the moment when it is poured to the moment it starts to tie the particles together, and that is called abbinden in German, and that is called the process of setting in English.

MR. HARDING: And that is something different from Erhärtung, isn't it?

THE WITNESS: Erhärtung is something different, and Erhärtung is the whole process in this book dealing with concrete, distinguishing between these two periods, between the period of setting which is called abbinden and it distinguishes between this chapter on concrete mixing and concrete structures, distinguishes between two periods the period that is called abbinden which corresponds to the German term setting.

THE COURT: You mean the English term setting.

THE WITNESS: The English term setting, and the period Erhärtung which covers the entire period until it comes into use.

THE COURT: You mean the entire period from the time the concrete is poured until you drive over it in an automobile?

THE WITNESS: Drive over it, yes, until it is finished.

MR. HARDING: We contest that, your Honor, and we, I believe, will be able to show that the period abbinden, the setting period, comes first, and then comes the Erhärtung or hardening period. Now that is exactly why the German patent does not meet our invention, because the application here is after the setting during the hardening period, whereas ours is essentially before the setting takes place, and that is apparent, I believe,

due to the fact that the patent is directed entirely to hardening.

THE COURT: Well, I never heard of placing any emphasis on the title. Now where is the word used in the patent?

MR. HARDING: In the first paragraph it says "keep moist during the hardening period".

THE COURT: Yes, that's true.

MR. HARDING: Now, in the second paragraph, page 2, we have the comparison with the setting period, because it says after they have set—there we have the word set——

THE COURT: I don't see Erhärtung.

MR. HARDING: Well, we have Erhärtungsperiode, the third line of the first column in the German patent.

THE COURT: Yes, I have that.

MR. HARDING: Now the next thing we come to is line 18, we have reference to setting.

THE COURT: Where is that?

MR. HARDING: First column, your Honor. Then we have——

THE COURT: Wait a minute.

MR. HARDING: Abgebunden, [illegible]t word, line 18.

THE WITNESS: Past participle.

THE COURT: Yes, so soon as sufficiently abgebunden—sufficiently set.

THE WITNESS: Sufficiently set. That translation I didn't object to that part.

MR. HARDING: They agree to that translation as a matter of fact.

Now, line 41, your Honor, which is very close to the top of the second column, first page, we have Erhärtungsperiode again.

THE COURT: Hold on a second.

THE WITNESS: 41.

THE COURT: Anstrichs, what does that mean?

THE WITNESS: Anstrichs is a paint. It means merely a coating.

THE COURT: Yes, all right. Is it used anywhere else?

MR. HARDING: Line 63, which is the first column of the first page we have Erhärtung again.

THE COURT: Yes. Anywhere else?

MR. HARDING: Now we have it in the claim, your Honor.

THE COURT: I see it there.

MR. HARDING: Fifth line from the end of the claim, your Honor.

THE COURT: Next to the last line, what is gleichmassige?

THE WITNESS: Gleichmassige, uniform.

By THE COURT:

Q. 27. Well, how do you say—it wouldn't make sense even to say equal or uniform cure, would it?

A. Well, there is no other expression used.

Q. 28. Would it?

A. Uniform cure, I think it would be approximately saying the same thing.

Q. 29. Well, isn't hardening a thing that has got to be uniform, the whole process cannot be uniform, hardening, it must be uniform. This is the only way——

MR. HARDING: Your Honor, this man doesn't know anything about concrete. He hasn't established himself as an expert in that line.

A. It is the only way you can translate.

Q. 30. You are taking a plain German word, which in the dictionary is plainly defined as to be translated as hardening and you are saying without the slightest knowledge of concrete that it has got some technical meaning.

A. I say there is no other term used in any German book on concrete for describing the process which is going on in concrete for even year by year or month by month is Erhärtung, and this book which is an authoritative book, says that the Erhärtung process takes place for years. That is just what it says. That is all I have to say. This is the only term that is used in this book, the two processes—abgebunden and Erhärtung are the two processes that are used in describing all the events that are happening with concrete from the moment it pours until it is finished, and a German couldn't say anything else.

THE COURT: I don't understand how it is important, really.

THE WITNESS: I mean——

THE COURT: No, not you; I am not saying you. How is it important?

MR. HARDING: You mean as to the meaning of the word?

THE COURT: Yes.

MR. HARDING: Fundamentally it is not important except for the fact that it should have its proper translation. There is no German word for cure, but we will show you that the German process is divided into two parts. That is, the German

divides this procedure into two parts. One is the hardening period, the other the setting period. Now, this German patent makes no disclosure whatever of doing anything to the concrete during the setting period. I will make that entirely clear by my expert, who will, I believe, give you a perfectly satisfactory explanation for it, with reasons. The reason that these people want to translate this word as "cure" is because my patent calls for "cure", and they want to make it out to be the same thing. Now they cannot do it by quibbling on words, and I don't care to quibble on words.

MR. OSTROLENK: Neither do we. We have a book here that the witness can refer to, and I would like to ask him now to make reference——

MR. HARDING: I don't think this witness is qualified to discuss the technique of concrete. He is a German speaking individual, I grant, but he is not a German student, and he is not an expert in concrete.

THE WITNESS: I am not an expert in concrete.

By THE COURT:

Q. 31. What passage in that book do you think bears out your theory?

A. The whole chapter from page 349.

THE COURT: Let me see it.

THE WITNESS: I can show you the chapter.

Q. 32. All right. Point out the word. You had better underline it.

A. It is the chapter on page 351, "abbinden," which extends until the top of the next page, and this chapter gives the periods of abbinden and how long it lasts, and the period of Erhärtung. This period of Erhärtung being described in the last paragraph of this chapter.

THE COURT: It takes five or ten hours, that's what it says.

THE WITNESS: Erhärtung takes for years, it says.

MR. HARDING: I object to his testifying about the book in so far as it involves a tendency toward expert testimony, because I don't think he has the slightest familiarity with the concrete art, and therefore, hasn't the remotest idea what these words mean in the concrete art.

THE COURT: As I translate it, it says: "From the setting or abbinden one should distinguish the hardening of the cement which from four to eight hours after the pouring begins and stretches itself out into periods of years."

THE WITNESS: That's what it says.

MR. HARDING: In other words, the hardening period begins some hours after the pouring which is just what we have stated right straight along, and prior to that comes the period of setting, the abbinden, and it is in that period that our invention finds the necessity for protection, whereas this German patent reference very clearly protects during the hardening period, which is the period following the setting period, apparently, from their own books.

THE COURT: I should say that certainly meant that way. That's how I translated it.

MR. HARDING: Maintaining my objection to the qualifications of the witness, I withdraw any objections to the book, your Honor.

THE COURT: I mean, doesn't that seem to be the fact?

MR. OSTROLENK: I wonder if we could have the witness translate it for us.

THE COURT: Didn't I translate it right? I am offended. Unterscheiden certainly means distinguish.

THE WITNESS: Yes.

THE COURT: From the abbinden from the setting to distinguish is, that's the German way to put it, is the hardening of the cement.

THE WITNESS: Yes.

THE COURT: Das, which—four to eight hours after anmachen—pouring—you say that's right—begins, and it is to jahrzehnte—that means periods of years—hinaus erstreckt—stretches.

THE WITNESS: That's right.

THE COURT: Go to the head of the class.

THE WITNESS: It is the word used in connection with the making of concrete, and there is no other term pertaining to the word cure.

THE COURT: I don't see we have any dispute about it. The abbinden seems to be the setting. I don't quite understand why that should be so because it certainly seems to be unloosing.

THE WITNESS: The translating in these dictionaries sometimes——

By THE COURT:

Q. 33. Under abbinden let me try this sentence: Die Vorgänge—what is Vorgänge?

A. It means takes place, something takes place.

Q. 34. The process of abbinden of Portland cement is not yet fully understood or explained.

A. Correct.

Q. 35. One thinks, however, that the chemical—what is umlagering, crystallization?

A. The change-over of particles. It is the umlagering—the shifting—it means some chemical reaction, some chemical rearrangement. Umlagering is chemical rearrangement.

Q. 36. Well, chemical rearrangement of molecules, and Wasserbindung must be water-binding?

A. Yes.

Q. 37. Now, wait a minute. In the ordinary case—What does d. h. mean?

A. Das heis.

Q. 38. Oh! i. e.; the longest setting cement does not begin to set until an hour after the pouring. Is that right?

A. I don't recall exactly.

Q. 39. Well, that is the sentence. Bei normal?

A. It means he describes two kinds of cement.

Q. 40. Oh, yes, he says: In the next faster binding cement——

A. In the case of normal cement, normal slow setting cement.

Q. 41. Slow setting. I didn't have that right. I don't think there is any doubt about it that abbinden does mean setting. That seems to be clear from the context.

MR. HARDING: I think that is true, your Honor.

Q. 42. And then they distinguish between that and the hardening?

A. I don't think they distinguish. They just talk about one. It means these two periods have to be distinguished, and I don't think there is a distinction between the times; one is overlapping the other.

THE COURT: Of course, I should think that really hardening is really a continuation of setting, isn't it?

MR. HARDING: Well, to get hard you have got to have something to get hard, and you have got this mud. It is plastic and has no body, and it assumes a body, that is, the set, then the body gets harder.

THE COURT: Rather curious word for setting, abbinden.

THE WITNESS: It is about the only term that we have. I looked at other books. They use the term abbinden all the time for the setting, describing the chemical reorganization of the material. This is called abbinden.

Q. 43. Here is another, Festigkeit. What does that mean?

A. Strength.

Q. 44. "And after seven days of Erhärtung"—listen to this, Mr. Harding. This is the next paragraph—"After seven days of Erhärtung, one day feuchter, is luft—air."

A. Air.

Q. 45. One day in moist air, six days under water—equals 120—what's that? Kilograms, I suppose, that is some measure of weight?

A. Kilogram per square centimeter.

Q. 46. That is a test of strength?

A. Yes, like pound to the square inch.

Q. 47. "Then after 28 days of hardening, 21 more days in the air, and then it gives a strength as 350"?

A. These are the strengths that the materials must meet.

Q. 48. I don't see that there is any mystery involved in it. Certainly that word means the hardening.

A. There is no other expression.

THE COURT: Whether we use the word cure when we really mean hardening, I don't know.

MR. OSTROLENK: We use that book to show that the two periods are the same periods.

THE COURT: Your book shows they are not the same periods.

MR. OSTROLENK: They are overlapping.

By THE COURT:

Q. 49. Well, I read that sentence. I am very proud of having been able to read it, but I won't read it again. It says here—you see it says that the setting begins an hour after the pouring, then the hardening begins four to eight hours after the pouring.

A. The way I read it, and I made a note of it, it says that the abbinden lasts five to ten hours, depends upon the circumstances.

Q. 50. Yes. Here it says the abbinden schwankt—does that mean lasts—between five and ten hours, and begins an hour after pouring. Then the hardening begins four hours to eight hours.

A. And lasts an indefinite period.

MR. HARDING: That certainly doesn't have the hardening included in the setting. I mean one gets on and gets to its point, then the other one comes along, and this patent refers to the hardening period, and specifically eliminates the setting period by its own language, inasmuch as it says in the first example it gives—"When the thing is sufficiently set."

THE COURT: Cement articles—well, "as soon as the sufficiently set"——

MR. OSTROLENK: That is one example given in this specification of one method of curing concrete.

THE COURT: I don't see why we haven't solved the mystery. What's your point now?

MR. OSTROLENK: It is a simple matter of arithmetic. Mr. Pineles has referred to one portion of

that German book and you have read from there that the setting begins at a certain time and extends——

THE COURT: Sooner than the hardening.

MR. OSTROLENK: That's right, and then the hardening overlaps that thing, according to the arithmetic of the thing and continues on after the setting is completed to a completion.

MR. HARDING: That is the most amazing arithmetic I ever heard of.

THE COURT: I don't know what you argue from it. It says they are distinguished. They are different processes.

MR. OSTROLENK: Yes, your Honor, they are different processes; we agree to that.

THE COURT: You are trying to claim, as I understand it, that they are the same.

MR. OSTROLENK: Oh, no.

THE COURT: Then what is the point?

MR. OSTROLENK: The only issue is whether or not the curing period, for one thing, whether hardening means curing. That was the first issue.

THE COURT: Well, it doesn't. I mean I don't know whether curing means hardening in English. I think you want an expert there, not a German expert.

MR. OSTROLENK: We intend to go further and put an expert on on that point, on the second point, and I think our expert can finally dispose of that matter. We started in the beginning by introducing this book. This book clearly shows that the setting begins at a certain time after pouring, extends over a certain period of time. In between the

time when it begins and the time when it terminates, the hardening, if you want to use that term——

THE COURT: I don't want to use that term. The book uses it.

MR. OSTROLENK: All right. Between the time of the beginning of the setting and the final setting, hardening begins and hardening continues from then on for a common period for a while, and then extends to a much longer time.

THE COURT: All right, I agree, but what are you trying to make out of this man's testimony, this expert's testimony, to affect your case? I don't see what you are trying to do.

MR. OSTROLENK: Exactly what I have just outlined to you is what I wanted to do, and that was all that was necessary; that is, I have pointed out——

THE COURT: Do you claim that this German patent is for the application of this film during the setting period?

MR. OSTROLENK: Correct, your Honor.

THE COURT: If you claim it the patent says it is not. I will tell you that. I never saw anything clearer in my life.

JAMES W. HOWARD, AN EXPERT WITNESS FOR DEFENDANTS.

HOWARD, by profession a consulting engineer, graduated from Renssalaer Polytechnic Institute, Troy, New York. He studied in France and Switzerland. Howard stated that he had a testing laboratory on roads, streets and pavements, to which specialty he had

devoted his time for some forty-six years. He stated that he read, wrote and spoke and thought in German, French and Spanish, that he lived with a French family and with a German family. He stated that he had done everything he could to obtain a knowledge of pavements and patents of all countries touching roads, streets and pavements and materials for making them. He stated that he had a library of about 1000 or more patents on the subject. He stated that he had been in a large number of patent cases and believed himself to be familiar with an interpretation of what patents show.

Howard brought out that he had a specification for all kinds of pavements employed by the City of Boston, New York, Philadelphia, Newark and others; that he had acted as an assistant foreman in the paving of streets, laying of concrete foundations and had been superintendent of construction of pavements and that he was familiar with all the tools used in pavement construction and with the details of paving, including concrete pavements. He stated that Portland cement and concrete had been a subject to which he had given a great deal of practical study and attention for some years. He stated that he had constructed concrete pavements, examined them, tested them and acted as arbitrator in concrete tests between the State of New Jersey and the contractors.

Howard stated that he had studied the Hayden patent in suit and briefly outlined the invention described in the patent as follows:

A. Briefly stated, in general terms, the Hayden patent in suit is a method of covering fresh concrete with a bituminous film, meaning asphalt or tar, in order to retain the water in the concrete, which water is necessary for the hydration of the calcium oxide, and then the calcium silicate into a stone-like mass, cementing together the other ingredients of the concrete, the

crushed stone or gravel and sand. This patent is one which when the film is thick enough—I mean by the patent, it states that this film of bitumen is placed thereon, a continuous film of bitumen, to prevent the water in the concrete from escaping principally by evaporation.

Howard stated that he had a copy of the German patent to Lechler, Defendants' Exhibit No. 4 and with reference to the German patent Howard testified:

A. It is the enclosing or covering of fresh concrete, the words here being in German frische de Beton, with a water-resisting or a waterproof bituminous substance or substances and the like to prevent the water in the concrete from disappearing principally by evaporation. That water is in there as described here in the patent as the water which is there for the forming of the material into concrete. The word in German for that is anmachewasser. It appears also in a little bit different form—it is one word though, Betonanmachewasser. I notice in the translation you have been talking about you have translated that "mixing". That mache is "make". The translation would be "the concrete forming water", that is, the water necessary to keep in there so that the concrete shall take its set and continue to harden. The two patents, if you will permit me to state, in principle and in detail are substantially the same as described in the patents.

Q. 10. Referring now to various sections of the German patent in their order, I want you to first tell me in general what is described in the first three paragraphs.

A. You will now permit me to point out errors in the translation, in my opinion, and sustained I think completely, in the translation that was put in by your honorable opponents.

Q. 11. Go ahead.

A. One or two of them are serious; the others are mere nothings. Can I recite a few? They translate the word u. dgl. etcetera. That means nothing. I means everything. The translation of that is "and the like". That compels this patent to say that it is like the material set forth in example below as far as bituminous coatings are concerned. The word "Erhärtung periode" that word means hardening, and if you look in any dictionary it also means lapidifying or stonifying or petrifying. You will find it in that dictionary. So that is what goes on chemically and physically. The next is the word in line 9 which they had but which should be "with a coating"; the word "mit" means with. I have spoken of the word that means "the concrete forming water". They translate that, "the concrete mixing water". The difference isn't very much but there is always a little surplus water runs off the top which I think is mentioned in the patent. Both patents mean that the water is essential to the crystallizing or forming of the concrete to stay in there. The word in line 13 "hoher" does not mean great strength. That is the comparative of the word; that means higher strength. Concrete from its very beginning when laid continues to have more and more strength, sometimes for several years, the chemical action continuing. On the 14th line is the word "erhalten". I have forgotten what they had but that word means preserve; greater strength remains preserved in the concrete. Line 18, I am speaking of the lines of the German patent, is the word "Form". We, in the construction of buildings, foundations, put up wooden forms. That is the technical expression; in every art there are expressions in the art. The tailor calls his shears, shears; the plumber calls his shears snips. Now, in this concrete art a great many words

have come in which are not in the dictionaries. That means the forms or boards placed so that the concrete is placed in these forms, rammed there or consolidated by jarring, and then the forms are finally removed when the concrete ~~can~~ sustain the weights that are to go upon it. Line 23 the word "bei" concrete structures, means for concrete structures. There was another word used there. I think they had the word "in". Now, in connection with that on lines 24 and 25, in connection with concrete structures as an example of one way that this patent can be applied, it says the concrete which has been put into those forms and rammed, et cetera, must have the surfaces coated. I speak of the word "surfaces" because it appears in both patents, and also because the upper portion of this concrete in the forms naturally has no forms or boards upon it. That certainly needs covering with some bituminous substance or otherwise to keep the water in. In line 30 the word is "bzw". That is a generally used word; in German, means "bezieungsseise". There are a great many meanings. They translate it "either/or", which lately I notice has been taken out of the law in Washington. That word, however, means "as well as", in connection with the dressed surfaces, are handled while fresh, as well as intermediate or contact surfaces where the concrete comes in contact with the boards of the form of mould. Line 41, is that long word that I had before, "Erhärtungsperiode". That is the singular of the plural; that means hardening, during the hardening, lapidifying, and in the jargon of the trade, concrete trade, means curing. Line 4, referring to the translation of the first one that I read you, it should read "especially if drying materials of the coating material are chosen which resist acids injurious to concrete". The words to be changed are "drying materials of the". It as you put turpentine in paint. That

is a drier. They put in the word "filler" and reverse it. Line 51 there has been inserted in that translation a repetition of some thing that went before, but the word is "it" translated to the German word "es", means as long as it is flowable, soft. Down below on line 55 the word "es" is here in the German patent, should be translated by "it", not by a noun or a word. In line 57 is the word "Anmachewassers". It is the genitive case of the nominative case, means "of the concrete water", means the concrete making water same as I spoke of before. "Mache" has been translated by them as making or mixing. There is naturally not much trouble about that. I presume that the mixing water will stay in there except what runs off when you first finish your surface. Sixty-four, the words in their paper, I have forgotten what it was for the moment, but it should be observed with "dry laying" means placing, sometimes called pouring, we pour concrete—as a matter of fact, we shovel it in place. Then in line 65 we have the word—I beg your pardon, it is not line 65-67. I will spell the word in German: "Schwindrissbildung". Incidentally the German words are really compound words without any —what do you call these things between the words—you just put them together. I believe that is called word building. They have the privilege of putting together any words they want to describe what they want. Therefore, Americans generally laugh at the long German words. That means, the "Schwindrissbildung" is the occurrence of shrinkage tears or cracks, whatever they may be, surface, interior or exterior. In the claim of the German patent the word in line 9 in the translation as presented by the other gentlemen—and I am sure in good faith—they used the word "the enclosing". Now, "the" is from the Latin "ille" means that something is before men-

tioned. Nothing has been before mentioned here. The word in the German patent is "an enclosure of the fresh concrete with a coating". Line 12 of the claim—and by the way, the numbers do not appear in this claim of the German patent—you have there the same thing as I have spoken of before, "Erhärtungsperiode". That means during the hardening or cure period, the word "cure" being one of the words of the art in this country and hardly in England and never in any other place. "Cure", of course, we will discuss that later. Now, on line 13 appears again that word "Betonanmachewassers". That is the genitive case, with the word that goes before it means "of the concrete forming water". Of course, as I have stated before, that is the water that is in the concrete desired to be preserved there by a waterproof or a water-resisting coating of bituminous nature in both patents

Howard continuing with reference to the setting of concrete, testified as follows:

Q. 14. Mr. Howard, what do you understand to be the period of setting of concrete?

A. The word "setting" in the art in this country means the hydrating of the calcium oxide into calcium hydrate. Calcium oxide is CaO. When water is placed there it ceases to be water and breaks into hydrogen and oxygen. Calcium hydrate is $CaH(HO)_2$. That means one part of calcium, one of oxygen, and then the others that I have mentioned combine chemically. That is the beginning of setting. The setting starts within a few minutes after making the concrete, it continues to set and secondary action starts in by which this silica SiO_2 is formed. That begins the secondary action till you combine chemically, by chemical affinity, with the calcium hydrate in part to form a calcium silicate. That entire process is the continuous setting

of the concrete, beginning within a few moments after it is mixed according to the weather. If it is freezing weather, of course nothing happens. That continues onward.

Q. 15. How long does that setting last?

A. That continues, the setting or hardening, the curing of the concrete, as we call it in the trade, goes on for months and years.

Q. 16. You misunderstood my question. I asked you how long does it take for concrete to set, how long does the setting last?

A. No definite time, begins to set immediately and goes on setting for, well, as I say, for months, the setting being a continuous setting, which is the same thing as hardening, crystallization as somebody has talked about it; but there is an empirical method established by the American Society of Testing Materials, the United States Government, and all authoritative works upon it here, which enables the laboratory to make what is called initial set and final set. Neither of them are really true, but the initial set is used by means of a Gilmore needle placed upon it from time to time for a few minutes or perhaps for an hour, to see if that flat ended needle will penetrate. The moment it ceases to penetrate, that is defined as initial set. It is necessary to know if the Portland cement is really acting chemically and setting. That is followed by a smaller needle of the same weight placed upon the concrete. I don't mean the concrete, I mean the cement, mixed with water, and when that large needle makes no perceptible impression that is accorded as the final set. I have tested hundreds of thousands of barrels in the last few years for the subway of Newark and other places, particularly the subway, and all those records, all those reports to the city, the time of the initial set, the time of the final set by this empirical method that is in their

specifications—it is in the specifications of standard books there is one that is really the bible of the concrete industry.

Q. 17. Will you please identify that book for me and tell me where there is any description of that setting that you have just described.

A. The title of the book is "Treatise on Concrete, Plain and Reinforced", by F. W. Taylor, M. E. and S. E. Thompson, S. B., published by John Wiley & Sons, New York, 1906. Answering your question, I find on page 30 the words, "Time of setting". There is a star to the bottom of the page. The paragraph designated by this asterisk quotes from the standard specification of the American Society for Testing Materials. They are the authority for the whole United States, and the words that follow are these: "Portland cement when made into a piece of certain size and placed in the ring with the necessary water called the water ratio for that brand of cement—each brand requires a little different amount of water—roughly speaking, cement requires from 4¼ to about 6 gallons of water per bag of cement, all bags of cement being taken as 94 pounds, in the American practice a barrel contains 4 bags of cement—the words are "It shall develop initial set in not less than 30 minutes, but must develop hard set in not less than one hour nor more than ten hours". That "hard set" is empirical. The "hard set" means the hardness by the empirical method used in the laboratories and by convention, and there are a great many other authorities that I could quote.

Q. 18. When does cure begin in concrete?

A. Cement samples and concrete samples come to my laboratory by the hundreds and for many years and the cure begins just as soon as we have a sample of concrete in its mould. It is kept in the mould for a

little while, then the mould is taken off and it is placed in a moist room or chamber or in wet sand; then the cure continues. In making prices for this work we always state that we will take the samples, cure them, cap the ends to make them smooth and parallel, and then test the crushing strength after the concrete is cured, one set of three specimen cylinders at the end of twenty-four hours if required (that is now required only upon the early or quick setting cements which have come in the market in the last few years, that is the twenty-four hour). The next is that we will test the strength of the samples of concrete at the end of seven days and next fourteen days, next twenty-eight days. Those are requirements for subway testing. Generally speaking, we make the test at the end of the cure of the concrete, at the end of seven days, and then twenty-eight days, that is so in most specifications.

Q. 19. In the German translation the word in issue is translated as hardening. What do you understand hardening to mean in the trade?

A. You mean Erhärtung?

Q. 20. Erhärtung in issue was translated as hardening in the American vernacular of the cement industry. What do they mean by hardening, what is the equivalent word in English that they use for that?

A. Talking in common trade among contractors the word "curing" is used or "this concrete has been cured."

Q. 21. I understand you to say that curing in America is the same as Erhärtung in German; is that right?

A. They have exactly the same meaning.

Q. 22. What is the word used for curing in England, what equivalent word in England is used to express a curing?

A. In no other country is cement called Portland cement except in here and England. That is because

one hundred years ago there was stone found in England which when heated made a hydraulic cement, that is, a substance which will hydrate, as I have described, chemically. The French expression is cement hydraulique; the German expression hydraulische cement.

By THE COURT:

Q. 23. Well, of course, Dr. Howard, concrete is finished, so to speak, and ready to use when it becomes hard, isn't it?

A. No, you cannot use it when it is hard, you use it when it is soft.

Q. 24. No, no, ready for use?

A. Oh, you mean for the purpose of the chemist?

Q. 25. Yes, when it is hard.

A. Then it has become hard enough for that purpose.

Q. 26. So whatever word you use to describe it becoming hard, it has become hard?

A. It has become hard.

Q. 27. And it is just a trade name to call it cured?

A. That's all, it means the same thing. It has been cured long enough to take down the forms. Mr. Edison was constructing a new power house and chimney and they began to take out his supports and forms and it began to come down. Our entire conversation with him—he was very deaf, you had to shout in his ear, and his engineers said that this concrete is not yet sufficiently cured and therefore not strong enough to remove the supports. The reason was he was using a sand with a whole lot of iron oxide in it which killed the cement, ruined it. He objected, I mean insisted on taking it down. He said, "We get sand here for nothing on our place." I said, "Mr. Edison, that is immaterial to me. The sand is all full of iron." So we took down part of the roof and parts of the foundation of the chimney and reconstructed with proper sand. His

cement, the Edison brand of cement, is an excellent brand.

By Mr. Ostrolenk:

Q. 28. Mr. Howard, if you will just—will you again state in a single sentence the invention that you have found described in the German patent to Lechler.

A. A preservation or conservation of the water in a concrete mixture placed there when the concrete is fresh and soft so that the water will remain there and perform the function of hydrating, crystallizing calcium oxide and eventually the silica dioxide.

By The Court:

Q. 29. Well, what do you make out of this sentence, "Zementwaren werden, sobald sie genugend abgebunden haben"?

A. What line?

Q. 30. It is line 17.

A. That refers to cement wares such as garden benches; I would take that to mean cement and sand.

Mr. Ostrolenk: His Honor has just asked you——

A. (Continuing.) Regarding it as if a cement ware were a concrete. It says that these cement wares—that means, of course, after casting or pouring in their place, since they have sufficiently held themselves together—a common phrase could be cure, using the word "cure."

Q. 31. No, now——

A. Then that could be——

Q. 32. Wait a minute now. Do you agree to what we have been talking about the meaning of the word "abgebunden"?

A. That means a setting, hydrating.

Q. 33. Why did you say held themselves together, because abgebunden really means loosen?

A. I know but not in this place here.

Q. 34. Yes, but then why do you say held themselves together, which it certainly doesn't mean? Why not use the technical term "set"?

A. Well, set would mean that it has been cemented together and become hard enough to remove the forms. It says, "As soon as the cement ware, material or object has hardened sufficiently, they are taken out of their moulds or forms." Therefore, here it is perfectly plain abgebunden means set or harden or stuck together.

Q. 35. We had a book and there was a whole chapter on abgebunden.

A. Well, I know but some know what they are talking about, others didn't.

Q. 36. How can you say this process is applied before the setting rather than afterwards, which is what I understood you to say?

A. In lines 8 and 9 you have the words "Das Neue Verfahren besteht"—will you use my translation?

Q. 37. Well, you can translate it for me right now.

A. "This invention consists in"——

Q. 38. "That the still fresh concrete."

A. "Eingehüllt"—means covered or encasing; the "frische Beton"—that is the French word the Germans use for concrete—therefore it says that the coating must be placed on fresh concrete.

Q. 39. Well, then, do you say that fresh concrete is concrete that is not set?

A. Yes, sir.

Q. 40. All right. Then there is an inconsistency in the patent, isn't there?

A. I think not.

Q. 41. There must be because in one paragraph according to you it says something about fresh con-

crete which you say means not set, and then in the next paragraph it says, "as soon as it is set."

MR. OSTROLENK: Referring to a specific adaptation of the invention.

A. You mean on line 18 the word "abgebunden"?

Q. 42. Yes.

A. That means as soon as it is enough set. That does not apply to when the material is placed on it, that is, the bitumen is placed upon it when it is fresh and therefore preserves the water in it, and as soon as, because of this bituminous coating, it has set sufficiently to be stiff, then you can take off the forms. I think that is perfectly clear.

Q. 43. And put the bitumen over it?

A. No.

Q. 44. That is what it says.

A. It can be done.

Q. 45. That is what that says, doesn't it?

A. In this case it says that. I was mistaken there.

Q. 46. "Dipped in the coating material."

A. It says there, "as soon as the concrete has set sufficiently without any protection"—that is what it means, don't it? Then you take off the forms and paint over it the bitumen.

Q. 47. What do you say about—further on it says, "Accordingly, while they are yet fresh, as well as the formed surfaces are to be coated forthwith after removal of the forms." That is down further.

A. Where, please. You have got to tell me.

Q. 48. About line 30.

A. That is an example of the use of what the patent calls for, namely, putting on a bituminous coating to keep the water in and would mean in case of the construction of concrete such as foundations, sustaining walls and foundations, then in that case you put

this protective coating of bitumen on the inside of the boards which constitute the form or mould in which the foundations are cast. We always put oil on there, we oil the boards before they go in, generally, if not always, oil the boards on the side that is going toward the concrete before we nail them in place. This is necessary to keep the boards from sticking to the concrete. This patent requires bitumen on these foundations and walls structure before you pour the concrete in there in soft condition in that case.

Q. 49. Well, do you make a distinction between the way you treat these what you call cement articles and the way you treat walls?

A. Well, in the cement articles, according to this, you can let it set for a little while, then take it out and put on some bitumen.

Q. 50. What do you call a cement article? Name a cement article.

A. Garden benches, figures of, well statues, garden furniture, also these sun dials and bird baths, coffins are made of cement, in which they let them set first enough to hold together, and then according to this——

Q. 51. What is the reason for that distinction, why do they let the cement articles set and don't let the other set?

A. That insertion in this patent had nothing to do in my opinion with what the patent states, namely, keeping the water in. That would only keep the water in that had not gone off in the time it was setting before you put the bitumen on in lines 17 to 21.

Q. 52. Yes, but what is the reason for that distinction, if there is one?

A. I think I have stated it plainly, that this provides that you can make the concrete articles, "Zementwaren"—ware—not concrete foundations, not

concrete roads or anything of the type; that is cement ware. Cement is used in forms—oh, by the way, all through this city and other cities we have today our electric light poles made of cement and sand and a little stone and in their manufacture we let them harden sufficiently and then put them in water so that the more water will not dry out. These poles and posts would be weak unless we keep the water in it, the same with pavements, foundations. We often ponded them, did for years, damned around them, put water over it. In 1894 we used to hire men to sprinkle it. About ten years of construction, I and many others—I don't know the others—standard practice or practically that, to have a hose to sprinkle it, constantly wetting the concrete, changing the men for the day and night the first three or four days to see it wouldn't dry out; it's always been known you have got to keep water in the concrete from the very beginning as far as possible. That can be done by ponding, can be done by sprinkling, the method of burlap is an improvement.

Q. 53. In reference to the paragraph of this German patent which talks about the cement articles, would it be as necessary for these cement articles to have the same strength that a concrete road would have to have?

A. In the case of posts for lamps and electric lights, it is necessary to have all the strength possible, but inside of those are also placed long bars of steel which enables the manufacturers to let a little water go out and then put them in the water baths to finish their setting, hardening. It would not do in the case of concrete foundations or pavements and on concrete pavements themselves it would be an unwise thing to let them stay exposed to the air and the wind longer than a few moments after they had been poured or placed. If that were done some water, particularly the

surface of these concretes, would evaporate away and not be there to perform its chemical function of hydrating the cement; spraying on or painting over all freshly laid soft concrete immediately after placing it or pouring it where it is to remain, should be done by the method of the patent in suit and the German patent, while that concrete is fresh, as nearly as possible immediately thereafter, if possible. I mean the apparatus is there, the men are there, the material, the bitumen, either emulsified asphalt or other asphalt. Incidentally, the emulsified asphalt does not stay there, it is put there as a means of getting the bitumen on there and it is stated in the patent in suit, the lines I can point out, the water quickly leaves it by breaking—that is the trade name—separating from the bitumen and is evaporated, and that it stays there, in the claim and various other places the use of emulsified asphalt is for the purpose of using it as a vehicle or means of getting the final continuous bituminous film on concrete providing this protection against the evaporation of water.

Q. 54. In the German patent, in the paragraph which follows the one mentioning this article, namely, paragraph starting on line 23 and which gives further examples of the application of the invention described, it mentions application of the water impervious film to the forms, to the retaining wall forms. Could that be done as a practical matter?

A. Certainly.

Q. 55. Would that prevent the evaporation of water?

A. Paint your boards with your bituminous compound before you put them there and nail them up or put them up with their holding devices, which are not always nails, then pour your concrete. Therefore, that concrete ab initio would naturally have the bitumen coating against it while the concrete is fresh.

Q. 56. In lines 32 to 33 of that German patent it is stated that the water impervious film is applied to the concrete while it is yet fresh and goes on to say that this is contrary to the previous practice of allowing the concrete to dry out before coating. What do they refer to there?

A. The words in German here are "solange sie noch frische", as long as it is still fresh. Answering your question briefly, why, of course on these foundations, structures, buildings, it means that that bitumen must be against that concrete while it is still fresh. Practically, it is there when the concrete is poured into the moulds, forms.

CROSS-EXAMINATION.

Howard under cross-examination admitted that there was nothing in the German patent to Lechler, Defendants' Exhibit 4, with reference to roadways. Howard stated that the German word for soft was "Weich" and stated that he did not say anything about the word being in the patent. He stated that in defining the word "frische" he explained that the word "frische Beton" meant concrete that would be still soft, mushy and unstable and which would still be what might be called soft. Howard stated that the word "frische", taking it literally, means "unset" and admitted that his translation of the word "frische" was a conclusion on his part, or his definition of what the word meant.

Howard stated that concrete begins to set or harden immediately and that, depending upon whether ordinary cement or the high early strength cement were used, the sidewalk might be completely finished so that people could use it over night or in three days.

Howard, stating that he referred to posts for electric lights in defining the word "wares" used in the

German patent, and admitted that the only abrasion to which such wares were subjected was that of the wind and freezing.

Howard testified that the Lechler patent came in at the end of his file, but he looked at it first when defendants' counsel, Mr. Ostrolenk, took it up with him some ten days before he testified.

Howard, with reference to difficulties in connection with concrete highways prior to the summer of 1925, testified as follows:

XQ. 109. Now, take your mind back prior to the summer of 1925. Was there or was there not any difficulty met with with regard to the surface of concrete highways?

A. Yes, by some and not by others. In some places we were ponded them, building, another thing, a round cup like a pond over the whole thing. It was well known, always been known for fifty years, that we must not let this dry out. That was the ponding method.

XQ. 110. Will you describe that method?

A. I have stated that on a stretch of road which must necessarily be level——

XQ. 111. You couldn't do it on a hilly road?

A. No, sir; there had to be other methods used. As I say, in 1894 or 1895, in Reading, Pa., we kept men there sprinkling it all the time. It was a hot summer; we didn't dare leave that concrete without keeping it wet.

XQ. 112. That was pretty expensive, was it not?

A. Yes. The beauty of this patent that you have, it reduces expense decidedly.

XQ. 113. It does reduce expense?

A. It decidedly reduces expense of doing the same thing that we did by ponding and sprinkling. There are other methods in vogue.

XQ. 114. Well, now, if you turn a hose on a concrete road immediately after it is laid when the concrete is soft, won't the water wash the cement away?

A. This throws on a spray and it will no more wash it away than you spraying or squirting on your water with some asphalt or emulsified asphalt. You must not squirt it on with a hose; you use a hose but it is a light spray constantly over it.

XQ. 115. You keep on doing that for how long, continuously?

A. If it is to be a concrete finish, it is. It depends on the weather, you know, slightly rainy weather or rainy weather we stop, but in partially dry weather and summer, when it is hot, that would continue for ten days.

XQ. 116. And it wouldn't wash anything away even if it were on a hillside or crowned road?

A. Certainly could.

XQ. 117. You can spray water on it?

A. I presume if it was done correctly, and it was done correctly when I had charge of it, and other people, too.

XQ. 118. Then you don't agree with my theory that surfaces of concrete road gave a good deal of trouble; is that correct, prior to 1925?

A. You mean the immediate film on the surface of the concrete pavement? The upper one-quarter inch or one-half inch, one-quarter inch, say, certainly we knew that that must be kept moist; otherwise the water would dry out, there wouldn't be enough water stay there to hydrate the cement and keep the surface firm and strong.

XQ. 119. Then that was accomplished, was it? And I am wrong in my theory that the roads didn't have a good surface?

A. They did have a good surface. Go through Holland, go through the United States; unusual care

was taken to keep these surfaces moist by various methods, but a great many of them failed and constantly do.

XQ. 120. I have a little booklet entitled "Portland Cement Concrete Roads," from a quarter of a century practical experience by J. W. Howard.

A. I wrote that pamphlet.

XQ. 121. Is that your pamphlet?

A. What is the date of it?

XQ. 122. 1914.

A. That was the time we were having trouble.

XQ. 123. I thought you would think that.

A. That was educational.

XQ. 124. Now, may I ask you——

A. Concrete pavements were failing terribly. A little later they got Mr. Abrams. He went on it and scientifically developed the modern road and improved it enormously.

XQ. 125. Do I understand that you recognize Mr. Abrams as being an expert in concrete roads and concrete generally?

A. Not in roads, but in concrete research generally, although I do not agree with him in some of his theories.

XQ. 126. But you credit his——

A. I generally think he is splendid, but his modulus —I am one that won't use it. I agree with him in certain limits.

XQ. 127. You credit him with having largely advanced the concrete art?

A. Decidedly, yes, he certainly did. He has been a great contributor to it. They used to call him professor; I don't know why.

XQ. 128. You would give his opinion respect, would you not?

A. I would have to take each specific case in which the opinion was given.

XQ. 129. Of course, I am excluding this case for the moment.

A. What?

XQ. 130. I am excluding this particular patent in suit for the moment.

A. I am not saying whether or not I agree with him here. I don't think it is wise for one engineer to give any criticism of the other. I am responsible to my conscience and my profession for what I tell you, not to the Court. I am only regretting we are not employed by the Court instead of——

XQ. 131. Let me read you from this booklet just a sentence, this booklet, "Concrete Roads," and ask you if you didn't write this?

THE COURT: Of course, he wrote it, he wrote the book.

A. I told you I wrote the whole of it.

MR. HARDING: I would like to read into the record, if I may, your Honor——

XQ. 132. "Each effort has sooner or later proved a failure and always for the same reason; Portland Cement concrete is too rigid and brittle to sustain the wear of heavy traffic and climatic changes without cracking and wearing." That is from page 1.

A. I wrote that sentence. They didn't use reinforcing then, and we have to reinforce them in every direction, particularly at the corners of the slabs. The slabs are sections of the concrete road.

XQ. 133. Now, further, that "it is too rigid, subject to cracking, and friable as a surface exposed to weather and traffic."

MR. OSTROLENK: Your Honor, I have no objection to cluttering up this record with what happened in 1914, but it does not seem to me pertinent.

THE COURT: I don't see the point of it either, myself.

MR. HARDING: Well, I just want to bring out, your Honor, that this witness has brought out in his own works exactly the problem that we have cured. In other words, I want to bring out clearly that we accomplished a very definite result in highways.

THE COURT: No question about that. He doesn't deny that.

A. No question about that. It is a very valuable addition to the art, your patent. It spurred others to find some way to compete with it.

RUSSELL R. BARRETT, A WITNESS FOR DEFENDANTS.

DIRECT EXAMINATION.

BARRETT stated that he was manager of sales for Leitch Manufacturing Company, one of the defendants and a produeer of bituminous road coatings, emulsified asphalt, different grades and kinds and for different purposes.

Barrett stated that road contractors used asphalt emulsions quite extensively for many purposes, as for making pre-mixed patching material for temporarily patching holes that develop in a road during the winter and for permanently patching roads and for building the roads, also for curing concrete and for maintaining the roads by applying it and covering it with stone chips. Barrett continuing stated that Leitch Manufacturing Company sold emulsion largely in tank cars or tank trucks.

CROSS-EXAMINATION.

Barrett under cross-examination admitted that he had sold emulsion to the State of New Jersey Highway Department for use under their specification and that the New Jersey State Highway Department specifications call for a particular kind of emulsion or concrete, the specifications calling for either grade AE or grade AE2 and that asphalt emulsion grade AE, when used for coating concrete, has a different water content than when used for other purposes.

HENRY W. WILSON, A WITNESS FOR DEFENDANTS.

DIRECT EXAMINATION.

WILSON testified that he was employed by Leitch Manufacturing Company as assistant to the president. He stated that he had never been charged with infringement of the patent in suit before receiving a notice in this suit and that he never received a letter from The Barber Asphalt Company charging him with infringement. He stated that if such a letter had come to his company, he believed he would have seen it.

HERBERT H. PORTER, A WITNESS FOR PLAINTIFF.

DIRECT EXAMINATION.

PORTER identified himself as living at Clarendon, Virginia, and qualified himself as a German scholar by stating that in his early childhood he traveled a great deal and that at an early age was taught a smattering of European languages. He later attended school and was taught languages, among others Ger-

man. He attended several private courses in German and studied scientific German at the Massachusetts Institute of Technology. That he was engaged from 1913 to 1917 in making searches and making translations from German into English. That he was in the service abroad during the war and in France for several months and had contact with several German prisoners. That following the Armistice, he again did search work and translation work in various languages from German into English. That he was special translator for the Federal Tariff Commission about 1920-1922. He stated that his translations had been accepted by counsel in a great many suits and that he had acted as and had prepared a large number of sworn translations which had been accepted in the Patent Office as true translations of original German documents for use in interferences, in proving priorities and the like matters.

Porter stated that he had made a translation of the German patent to Lechler, Defendants' Exhibit No. 4, and identified a copy of the translation made by him, Plaintiff's Exhibit No. 9.

With reference to the translation of the Lechler patent, Porter testified as follows:

Q. 5. Mr. Porter, I show you a copy of the Lechler patent in German and would ask you if you would discuss the meaning of the word Erhärtung, which appears variously throughout the patent and you might also discuss it in connection with the word "abgebunden," which also appears in the patent. Those, I think, are the principal words.

A. You have handed me a photostatic reproduction of the Lechler German Patent 337,134. At several places in this patent appears the German word "Erhärtung"; the meaning of this word in German corresponds to the English word "hardening." On the first page at line 18 is the German word "abgebunden,"

which is the past participle of the German verb "abbinden." This German word has the same meaning in German as the English verb "to set," when used in reference to mortar and concrete.

Q. 6. Have you with you a dictionary which will give us the meanings that you have given to these two German words?

A. I have.

Q. 7. Will you produce it, please?

THE COURT: Is that the same or a different one?

MR. HARDING: We have here, your Honor, a technical dictionary in German, that is, it is a German to German dictionary.

THE COURT: Oh, you mean it is not translated into English?

MR. HARDING: No, sir, it is German to German.

Q. 8. Will you tell us what that dictionary is?

A. This volume is entitled "Technischer Wortschatz," by Hager and others, printed at Stuttgart and Berlin, 1920.

Q. 9. How long have you had that dictionary in your possession?

A. I visited Stuttgart in 1927. The dictionary has been in my possession since prior to that time. I should say that I purchased it around 1924.

Q. 10. Will you please turn in the dictionary to the pertinent part with reference to the German words we have been discussing and read what it has to say about them and their meaning.

A. On the first page of the encyclopedic matter which appears to be page 9 of the volume as a whole, I find in black letters the word "abbinden." I will translate the words following it as follows: (1) of mortar: a transition from the pasty condition into the

rigid or solid one (becoming rigid). After the "abbinden" (setting begins the "Erhärten" (hardening). The time which extends from the Anmachen (mixing) of the pure binding medium (usually cement or hydraulic lime) up to the beginning of the solidifying or becoming rigid, is called Abbindzeit (setting time).

Two further definitions are given, but these have no pertinence for mortar or cement.

Q. 11. Is that all that that book contains, which is of interest to us?

A. I do not recollect at the moment any further point of general interest.

MR. HARDING: I offer this dictionary, more particularly page 9, in evidence as Plaintiff's Exhibit No. 10.

(Received and marked Exhibit P-10.)

Q. 12. Will you point out (interrupted)——

By THE COURT:

Q. 13. Isn't that just what was read?

MR. HARDING: Yes, your Honor.

Q. 14. Did you read that, "the time from the mixing"?

A. Yes, sir.

Q. 15. You read the whole thing, not abbinden?

A. Down to the second definition; the second definition relates to wood construction.

THE COURT: Oh, yes, of course.

By MR. HARDING:

Q. 16. In that translation which you have just made from Plaintiff's Exhibit 10, the words you have translated as hardening, are they the words used in the Lechler patent?

A. They are.

Q. 17. And you made reference to setting; is that translation of the same word as is used for setting in the Lechler patent?

A. It is giving due regard to changes necessitated by the parsing of the verb.

Q. 18. Well, we have in the Lechler patent "abgebunden" and in the dictionary we have the word "abbinden." Will you explain the relationship between those two words?

A. "Abbinden" may be said to correspond to the infinitive in English, while "abgebunden" corresponds to the past participle. Thus in English "to bind" is the infinitive of the German "binden" while "bound" is the past participle corresponding to the German "gebunden."

Q. 19. Will you refer now to the second paragraph of the German copy of the patent which you have, which you have translated "still fresh concrete"—will you discuss what the meaning of "still fresh" with reference to concrete is in that second paragraph from the German and from the context with the patent?

A. In stating the meaning of this word in German and giving its English equivalent, I have in mind the customary use of the words "fresh concrete" in the United States as referring to concrete during the period before it is ready for service. This meaning is reinforced obviously by the statement in this German patent in the paragraph beginning on page 1 at line 17, where it is stated that cement goods are dipped or coated with a coating material as soon as they have become sufficiently set and can be removed from the form. I also find in the next paragraph which begins on page 1 at line 22, a statement at lines 30 to 32 which refers to the treatment of foundation walls, retaining walls and the like, after the removal of the form.

Q. 20. Does the use of the word "Erhärtung" have any effect upon the meaning of what you have translated as "still fresh"?

A. I regard the German word "Erhärtung" with the corresponding English word "hardening" as referring to the result. The word "frische" and the corresponding English word "fresh" refer to a condition where the material is recognized as in a condition preliminary to its normal employment.

DUFF ABRAMS, A WITNESS FOR PLAINTIFF, RECALLED ON REBUTTAL ON DIRECT EXAMINATION.

On rebuttal Abrams produced three specimens of concrete, one of which he stated was made at 11 o'clock the previous night and comprised a mixture corresponding to that used in concrete road construction, the second of which was recently mixed concrete mixture made some thirty minutes prior to his testimony using the same materials and proportions and the third was concrete about two months old.

Abrams pointed out that the specimen made at 11 o'clock the previous night was about twelve or thirteen hours old and had set and partially hardened. He pointed out that the surface could be indented with a sharp tool. The Court inspected the specimen and noted that no impression could be made on it with the finger.

The Court noted that the specimen mixed thirty minutes before could be indented with the finger.

With reference to the German patent, in connection with the specimens Abrams testified as follows:

A. I would say undoubtedly it referred to the one which thoroughly set rather than to the one which is in soft, plastic condition.

Q. 173. Can you find anywhere in the German patent anything which would lead you to believe that there was any attempt to apply a coating to concrete in the condition of the unset specimen which you have produced?

A. I found nothing in Lechler's patent to even remotely suggest that he had in mind application to anything but set concrete.

Q. 174. Is there anything in the Lechler patent which would tell you how to apply a coating of asphalt, which I understand is an oily material, to the unset wet specimen that you have produced?

A. There is nothing in Lechler's patent to indicate any method that would be applicable to such a purpose.

Q. 175. Would you normally, leaving out of your mind for the moment the patent in suit, believe that an oily coating could be applied to that unset concrete specimen that you have, for the formation of a continuous water impervious film on the surface of it?

A. I would not have thought so unless I had seen it done.

Q. 176. Did you think so when you first saw the patent in suit or heard about it?

A. I was not very much convinced that it could be done.

Q. 177. Would it present any very great problem to you to apply a bituminous coating to the set concrete such as the specimen you have produced?

A. No, I think that had been done in much the manner described by Lechler for waterproofing purposes.

Q. 178. Would it be possible to paint a coating on the set specimen?

A. Entirely so, it would be a very common procedure.

Q. 179. Could you paint a coating on the unset specimen?

A. You could not.

Q. 180. Will you discuss your understanding of the meaning of still fresh concrete used in the second paragraph of the Lechler patent in connection with the text of the patent as you understand it?

A. The word "fresh" is used in an extremely general sense in reference to concrete. In fact, both of these specimens would be referred to and could properly be referred to as fresh concrete. However, probably the most prevalent term in referring to concrete of this hardened type as contrasted with the still soft concrete would be to call it green concrete. Both of these specimens are fresh. This one would be still green.

Q. 181. Well, now, are you referring to any narrow meaning of the word? You say they are both fresh, or are you using the word fresh in its general sense?

A. I am using it in the sense it is used in the concrete art.

Q. 182. Well, now, what would be its meaning in your opinion as used in the German patent?

A. In view of the subsequent disclosures there is no question in my mind he refers to the set concrete as fresh concrete.

Q. 183. Does it have any meaning with reference to the unset concrete to you in the German patent?

A. There is nothing in there that would indicate to me that he is referring to unset concrete.

Rebuttal Cross-Examination.

On cross-examination Abrams testified with reference to the specimens as follows:

XQ. 184. You have here two samples of some concrete which has been laid, one which I understand you to say was made about fifteen hours ago and the other about thirty minutes.

A. Thirteen hours in one case, and about thirty minutes in the other.

XQ. 185. And you described both of these as freshly laid concrete.

A. I didn't say that they were freshly laid.

XQ. 186. Which is freshly laid?

A. This is freshly laid.

XQ. 187. And this——

A. That I referred to as green concrete.

XQ. 188. When is concrete fresh concrete?

A. It is fresh from the time the materials are mixed together until it is ready for service.

XQ. 189. Then the sample that was laid yesterday is fresh concrete?

A. Is fresh concrete.

XQ. 191. What is the difference between fresh concrete and freshly laid?

A. If you refer to concrete specifically as freshly laid it refers to the interval immediately following the placing and finishing of it.

XQ. 192. That is, you make a distinction between the adjective and the adverb, is that correct?

A. Well, I don't know just what you mean by those terms.

XQ. 193. Well, the word fresh is an adjective defining the condition of the concrete. Freshly is an adverb of the same origin, and you make a distinction as to the meaning when the word is used as an adjective from the way it is used as an adverb.

A. Well, I make this distinction that is described when the terms are applied to concrete.

OPINION.

(Filed March 21, 1936.)

IN THE DISTRICT COURT OF THE UNITED STATES,
FOR THE DISTRICT OF NEW JERSEY.

The Barber Asphalt Company,
Plaintiff,

v.

Stulz-Sickels Company and Leitch Manufacturing Company, Inc.,
Defendants.

Appearances: MESSRS. PITNEY, HARDIN & SKINNER, by DONALD B. KIPP, ESQ., GEORGE J. HARDING, ESQ., for the plaintiff;
MESSRS. OSBORNE, CORNISH & SCHECK, by SAMUEL OSTROLENK, ESQ., for the defendants.

CLARK, *D. J.*

This is a dispute between two manufacturers of bituminous (asphalt) emulsion (The Barber Asphalt Company and the Leitch Manufacturing Company, Inc.). Joined as a defendant is the jobber (Stulz-Sickles Company) who sold the product to the ultimate consumer, a road contractor (Standard Bithulithic Company). The plaintiff company had more foresight than the defendant company. It acquired a patent (to Hayden, No. 1,684,671) covering a process for the treatment of a road concrete with the said bituminous emulsion. It will thus be noticed that we are being asked to enjoin a so-called contributory infringement (Walker on Patents, Section 434, page 526).

At the time of the trial and argument, it was suggested that the actions of the defendants did not bring them within the scope of this somewhat obscure doctrine. We were told that the last word in the Supreme Court did not permit the restraint of the sale of unpatented materials for use in a patented process (Carbice Corp. v. American Patents Development Corp., 283 U. S. 27). There is a sentence in the opinion of the learned Justice who spoke for the court in that case which bears that interpretation. It reads:

> "The owner of a patent for a process might secure a partial monopoly on the unpatented material employed in it." (P. 32.)

That the matter is not free from doubt is well indicated by the varying opinions of the three very able judges who passed upon the question in the above named case (American Patents Development Corp. v. Carbice Corp. of America, 25 Fed. (2d) 730; 38 Fed. (2d) 62).

It had been our impression that the logic of the rule of contributory infringement required the inclusion of the sale of unpatented substances or supplies. That logic is apparently the recognition of motive as an element in the tort of infringement of a patent right (Roberts, Contributory Infringement of Patent Rights, 12 H. L. Rev. 35). The strange inconsistency in the reported decisions in the law of torts generally is well known (Ames, How Far an Act May Be a Tort Because of the Wrongful Motive of the Actor, 18 H. L. Rev. 411). The rule of the civil law is more satisfactory. A French writer, Larombiere, with the flair for accurate intellectual expression for which the thinkers of that nation are famous, has thus phrased it:

> "In order that the exercise of a right should guarantee entire and perfect freedom from liability, it is necessary that the person who exercises

> it should make a prudent use thereof, with ordinary precautions, without abusing it, and without exceeding its just limits. Any abuse which he should make of it which causes damage would render him liable to repair the damage so caused."

(And see Josserand, L., De l'Abus des Droits (Paris) 1905; Charmont, art. in Rev. Trim. 1902, p. 113 and Obligations, ed. of 1885, art. 1382, n. II, V. 7, p. 544 and cf. Toullier, V. II, n. 119.)

The English courts have been indifferent to the intent of the infringer and have apparently repudiated any doctrine of contributory infringement. We quote from Sir George Jessel, the famous Master of the Rolls, in the case of Townsend v. Haworth, reported in a note to Sykes v. Howarth, English Law Reports, 12 Chancery Division, 826 at 831:

> " 'The chief of these chemical substances are substances which are perfectly well known, and most of them are common substances; they are all old chemical compounds, and there is no claim in the patent at all except for the peculiar use of these chemical compounds for the purpose of preserving the cloth from mildew. No Judge has ever said that the vendor of an ordinary ingredient does a wrong if the purchaser coming to him says, "I want your compound, because I want to preserve my cloth from mildew. I wish to try the question with the patentee". No one would doubt that that sale would be perfectly legal.' "
>
> " 'You cannot make out the proposition that any person selling any article, either organic or inorganic, either produced by nature or produced by art, which could in any way be used in the making of a patented article can be sued as an infringer, because he knows that the purchaser intends to make use of it for that purpose.' "

and from L. J. Mellish, affirming in the same case in 48 L. J. (Ch.) 773, n:

> "'I am of the same opinion. I think it is quite clear that at law the defendant would be entitled to a verdict on a plea of not guilty. Selling materials for the purpose of infringing a patent to the man who is going to infringe it, even although the party who sells it knows that he is going to infringe it and indemnifies him, does not by itself make the person who so sells an infringer. He must be a party with the man who so infringes, and actually infringe'."

And in the United States the idea seems to have been accepted grudgingly rather than logically (Carbice Corp. v. American Patents Development Corp., 283 U. S. 27, above cited; Motion Picture Patents Co. v. Universal Film Mfg. Co., 243 U. S. 502; Morgan Envelope Co. v. Albany Perforated Wrapping Paper Co., 152 U. S. 425). As by definition we are dealing with intent and not action, it is difficult to perceive how we are concerned with the patented or unpatented character of that action or with such qualities as indicated by the adjectives, perishable, consumable, essential, necessary and dynamic.

Reflection has led us to the conclusion that the manifest disinclination of the Supreme Court to broaden injunctive relief in cases of contributory infringement may be due to the equitable doctrine of balance of convenience. We have spoken before of the proneness of American judges to use or rather abuse their injunctive power. We have seen it in labor cases and we have seen it in the removal of constitutional questions from state courts. The automatic trial of patent cases by the same method is apparently due to a distrust of juries rather than to any thorough analysis of the adequacy of the remedy at law. This tendency has become more marked of late years. We find in the earlier reports many instances of the jury's consideration of the question of fact of invention (Market Street

Cable Railway Co. v. Rowley, 155 U. S. 621; Overweight Counterbalance Elevator Co. v. Improved Order of Red Men's Hall Ass'n of San Francisco, 94 Fed. 155; Plastic Fireproof Construction Co. v. City and County of San Francisco, 97 Fed. 620). We think that twelve average and ordinary men are especially qualified to appraise the qualities of the average mechanic or inventor.

An able statement of the argument for the exercise of equitable jurisdiction is found in the above cited article by Mr. Roberts, that very learned writer on patent law:

> "The question has been asked, and probably has been urged by the defendant in every case of contributory infringement, whether a perilous precedent was not being established which might lead in conceivable instances to an unjust embarrassment of a manufacturer or seller of articles innocent in themselves, which, nevertheless, had become actual instruments of wrong in the hands of others. There is always, nominally at least, a clear remedy for the patentee by suit against the immediate infringers whose acts are punishable by injunction, whether or not any actual intent to infringe existed. In many cases, however, such a remedy is wholly inadequate. A manufacturer who distributes thousands of infringing machines is the only defendant against whom the patentee can obtain real relief; for as against the purchaser and user a suit in equity could not reimburse the patentee for the unavoidable expenses of his suit; the courts recognize the existence of this state of things, and in cases of contributory infringement assist the patentee, so far as possible and proper, in his attempt to stop the trespass at its origin rather than compel him to take a course which practically opposes an impossibility to his effort toward establishing or enforcing his right."
> (Pages 39-40.)

The opposite point of view is summarized by L. J. Vaughan Williams of the English court of appeals in the case of Dunlop Pneumatic Tyre Company, Ltd. v. David Moseley & Sons, Ltd., English Law Reports, 1 Chancery Division, 612 at 619:

> "But I should like to add that I cannot conceive that the practical result of our judgment will be to inflict any injury upon the plaintiffs. If the parts manufactured and sold by Messrs. Moseley are eventually used for the purpose of making the patented tyres, and thus infringing the plaintiffs' patents, the plaintiffs will have full opportunity of suing those persons who thus infringe their patents, and the fact that the plaintiffs were not able to sue the present defendants for selling some article which might or must be intended for use in making the plaintiffs' tyres would not, in my judgment, practically deprive the plaintiffs of the power to enforce any rights and privileges to which they are entitled as patentees."

Mr. Roberts, from whom we have just quoted, has foreseen the inconvenience in the rule he advocates for we find him saying at p. 44:

> "In its enforcement, this rule will be guarded by such terms of application as will prevent it from embarrassing the person enjoined in the performance of the acts in question when properly dissociated from any wrongful intent."

It is because of the difficulty of "properly dissociating" the act and the intent "by the terms of the application" that we think the balance is against the exercise of equitable jurisdiction. A broad injunction contains the threat of numerous prosecutions for contempt against the manufacturer or supplier of the unpatented materials. It places in the hands of the patentee, therefore, a weapon for forging the partial mon-

opoly of unpatented materials objected to by Mr. Justice Brandeis in the Carbice case above cited.

Fortunately perhaps, we are not constrained to an accurate forecast of the ultimate law of contributory infringement. This, because in our opinion the Hayden patent is completely anticipated by the German Patent to Lechler, #337,134. As the "refrigerating" patent in the Carbice case was described by Justice Brandeis as one of space (his words were "locational arrangement", 283 U. S. 420 at 421), we might describe the process in suit as one of time. The revolutionary invention of concrete depends, as we understand it, upon the recognition of the chemical reactions of certain inorganic substances, cf. sand, cement, gravel and water (Principles of Reinforced Concrete Construction, Turneaure and Maurer, Chapter 2; Manual of Reinforced Concrete and Concrete Block Construction, Marsh and Dunn, Part 1). This process is known as hydration and by hypothesis calls for some means of preventing evaporation. According to both the patentee's specification and the fact, the earliest method of avoiding the loss of water was the simple one of adding more water by the clumsy use of water soaked burlap bags, dikes, sprinkling, etc. Evaporation (the conversion into a gaseous state) is caused by contact with the air. Some might, although the defendant did not, question the genius involved in sealing or air-tighting the concrete mixture at any time. Both the patent and the fact indicate that this was done by the very type of emulsion whose use is now sought to be restrained.

According to the patent and apparently according to the fact, this sealing or air-tighting did not take place immediately after the mixture was finished or poured, although exactly when it did take place seems uncertain. For the purposes of the case at bar, it is

sufficient to say that according to both the specification and the claims of the patent in suit, the application of a bituminious emulsion is prior in time to that indicated by the teaching of the prior art.

The patent in its specification and claims uses four time fixing adverbial phrases. We set them forth in their context:

> "Preferably, the film is applied *as soon as practical after the cement or concrete is laid and finished;* however, it must be applied *before the concrete has set,* . . . if the benefits of my invention are to be obtained." (Lines 72-77 page 1.)

> "A bituminous paint . . . Such a paint when applied, . . . *as soon as practical after pouring and finishing* of the concrete, but in any event *before the concrete has set,* will form a satisfactory protective impervious film, ..." (Lines 92-104, page 1.)

> "To the surface of wet unset concrete and preferably *as soon as practical after laying and finishing,* I apply, as by means of a spray, a water-external-phase bituminous emulsion such as is often called in paving practice 'cold repair cement'." (Lines 6-12, page 2.)

> "I have found that cement concrete which has thus been protected by the application thereto, *when freshly placed,* or *before it has set,* of a water impervious and preferably adherent film possesses a remarkably higher tensile strength after curing or aging than is possessed by the same concrete not so treated, and the occurrence of hair cracks is avoided." (Lines 18-26, page 2.)

> "3. The method of preventing evaporation of water from the surface of a *freshly laid* cement concrete roadway which consists in spraying upon such surface, *as soon as feasible after it is laid* and *before* it has cured, a continuous bituminous film." (Lines 84-89, page 2.)

> "4. The method of preventing evaporation of water from the surface of a *freshly* laid concrete roadway which includes spraying upon such surface *before the concrete has set*, a bituminous emulsion for the formation of an adherent water impervious bituminous film thereon." (Lines 90-96, page 2.)
>
> ". . . . but with my new method the curing proceeds without interruption to completion. This is of particular advantage in road construction as construction traffic may be directed over the new concrete *after say one week* without interrupting the curing of the same." (Lines 45-51, page 2.)

It will be observed that all these adverbial phrases are general rather than specific and in only one of them is any definite period of time mentioned. In other words we are not told after what lapse of time cement or concrete is freshly laid, after what lapse of time it is feasible or practical to spray it with emulsion or at what time it has set. We can only infer that it must be within the first week of its life. An attempt was made at the trial to give a trade meaning, so to speak, to the phrase "before the concrete has set." There was testimony by experts, from both sides, as a matter of fact, describing the chemical reactions of cement and water from which we deduce the process is divided into two parts (not three like Gaul). The first of which is the hydrating of the calcium oxide into calcium hydrate and the second is the formation of silica (Testimony, Ahrams, p. 81; Howard, p. 222). The experts refer to the first reaction as setting and to the second as hardening. Their views were to some extent substantiated by the German technical book introduced in evidence (Handbuch der Steinkonstruktionen, Professor Otto Frick) wherein the learned author states:

"From the setting is to be distinguished the hardening of the cement, which begins 4 to 8 hours after the mixing and lasts for decades." (p. 352.)

The patentee seems, however, to have disclaimed any such technical interpretation of the phrase because he has supplied us with an empirical one of his own. The specification and claims define this test as follows:

". . . . until the concrete has set, *or attained a rigidity such as to withstand a substantial weight without marring,* after which the burlap is removed and the surface covered with earth, or straw, which is maintained wet until the expiration of the stipulated curing period, when, the earth, or straw, is removed." (Lines 17-24, page 1.)

"Another method, which has been attempted, involves the spreading of tar on the surface of the concrete after the concrete has set, *or attained a rigidity such as to enable workmen to walk on it without marring the surface.*" (Lines 24-29, page 1.)

"I have discovered that if cement or cement concrete be treated, after it is finished, i. e., smoothed off, or broomed if so finished, and before it has set, i. e., *before it will support a substantial weight, such as that of a man walking on it, without marring.* . . . . the concrete will cure without hair cracking." (Lines 47-58, page 1.)

". . . before it has set, by which, as has been indicated, I mean before the concrete *has attained a condition of firmness or rigidity such that it will support a substantial weight, without marring of the surface, as for example, the weight of a man walking on it.*" (Lines 66-72, page 1.)

This is an entirely different standard from that of the American Society for Testing Materials (Treatise on Concrete, Plain and Reinforced, F. W. Taylor,

M. E., and S. E. Thompson, S. B., (1906) p. 30), which is made to depend upon the penetration of the mixture by two different sized Gilmore needles. That interesting work further subdivides the setting process into an initial set occurring in not less than thirty minutes and a *hard* set in not less than one hour nor more than ten hours (Testimony, Howard, p. 224).

The attempt to avoid anticipation by the German patent (Lechler) is built around this technical meaning of the word "set" and derives from the use in that patent of the German words, "abbinden" ("abgebunden") and "erhartung". The first word appears on page 1, line 18 and the second word appears in the title and on page 1, lines 3, 41, 63 and on page 2, lines 10 and 13. The German handbook on concrete, above cited, and one of the technical dictionaries (Technischer Wortschatz, by Von Dyck) seem to acknowledge the existence of the two chemical processes in the formation of concrete and to find them phonetically differentiated by the words "abbinden" and "erhartung." We were furnished, however, with two dictionaries (Hoyer-Kreuter Technological Dictionary and Illustrated Technical Dictionary by Schlomann) in which "erhartung" is also used to indicate setting.

We do not believe that either patent requires us to resort to such niceties. The German patent (Lechler) states the problem of curing concrete and the principal difficulty of its solution in language very similar to that of Hayden. In two places Lechler refers to the enclosing or coating of the concrete while still-fresh or yet fresh (page 1, lines 9 and 30-31). He further points out that this is contrary to the previous practice of allowing the concrete to dry out. That part of the patent in which the word "abbinden" is used bears out, rather than refutes, this interpretation of anticipation. It will be borne in mind that the Lechler

patent is not concerned with flat and adherent concrete but rather with upright and independent concrete—concededly an analogous art. For that reason molds or forms are necessarily part of the art and the patentee is compelled to prescribe the dipping in the coating material after the articles have achieved a certain rigidity. Otherwise, there is nothing to dip as obviously liquid cannot be dipped in liquid. It is in that sense we think Lechler uses the word "set" and to give it the technical meaning argued for by the plaintiff would be to entirely ignore the rest of the sentence which reads, "and can be removed from the mold." Both patents to our way of thinking evince an intention to apply the coating material of bituminous emulsion at an earlier stage in the life of the concrete than had been the previous practice. Neither patent fixes with any exactness at just what moment that earlier stage has arrived.

We conclude that the world already had the conception of coating as soon as practical after pouring rather than at some later stage of the hardening process. In other words, we think that any fair emphasis on the teaching of the German patent must stress the adjective "fresh."

DECREE.

(Filed May 11, 1936.)

This cause having come on to be heard on the pleadings and evidence herein and upon briefs filed on behalf of the parties and upon the argument of counsel for the parties and determined by the Court; and thereupon upon consideration thereof, it is

ORDERED, ADJUDGED AND DECREED:

First: That the title to the United States Letters Patent in suit, No. 1,684,671, granted on September 18, 1928, is vested in The Barber Asphalt Company, the above-named plaintiff.

Second: That United States Letters Patent No. 1,684,671, dated September 18, 1928, to Hayden, are invalid as to claims 4, 5 and 9 reading as follows:

> "4. The method of preventing evaporation of water from the surface of a freshly laid concrete roadway which includes spraying upon such surface, before the concrete has set, a bituminous emulsion for the formation of an adherent water impervious bituminous film thereon.
>
> "5. The method of curing a concrete roadway which includes applying to the upper surface of a roadway, before the concrete has set, a coating of unheated bituminous paint-like material for the formation of a water impervious film thereon and permitting the concrete to cure.
>
> "9. The method of curing a body of cement concrete having an exposed surface, which includes applying to the exposed surface of the concrete, before the concrete has set, a water-external-phase bituminous emulsion for the formation of an adherent water-impervious film on such surface and thereafter permitting the concrete to cure without substantial disturbance of the body thereof."

Third: That the stipulation of fact of record and the opinion of the Court, filed March 21, 1936, shall constitute findings of fact and conclusions of law in accordance with Equity Rule 70½.

Fourth: That the bill of complaint be and hereby is dismissed with costs to defendants to be taxed.

WILLIAM CLARK,
United States District Judge.

Approved as to form:

PITNEY, HARDIN & SKINNER,
Solicitors for Plaintiff.
OSBORNE, CORNISH & SCHECK,
Solicitors for Defendants.
Dated May 11, 1936.

ASSIGNMENT OF ERRORS.

(Filed May 14, 1936.)

Now comes plaintiff in the above-entitled cause, by its attorneys, and says that the decree entered in the above-entitled cause on or about the eleventh day of May, 1936, is erroneous and unjust to plaintiff, and assigns errors as follows:

1. That the Honorable Court erred in holding Claims 4, 5 and 9, respectively, of the patent in suit to be invalid.

2. That the Honorable Court erred in holding the patent in suit to be anticipated by the German patent to Lechler, No. 337,134.

3. That the Honorable Court erred in failing to find invention in the subject matter of Claims 4, 5 and 9, respectively, of the patent in suit over the German patent to Lechler, No. 337,134, and in failing to hold that Claims 4, 5 and 9, respectively, were valid and infringed.

4. That the Honorable Court erred in failing to hold that the patent in suit was valid and infringed.

Wherefore, and for divers other errors in the record, proceedings and decree of the Court in this cause appearing, said plaintiff prays that the decree entered herein on or about the eleventh day of May, 1936, be reversed, with costs to defendants.

Dated May 12, 1936.

THE BARBER ASPHALT COMPANY,

By PITNEY, HARDIN & SKINNER,

Solicitors for Plaintiff.

PLAINTIFF'S PETITION FOR APPEAL.

(Filed May 14, 1936.)

The above-named plaintiff, The Barber Asphalt Company, conceiving itself aggrieved by the decree in the above-entitled cause entered on the eleventh day of May, 1936, does hereby appeal therefrom to the United States Circuit Court of Appeals for the Third Circuit, and prays that this appeal may be allowed and a citation issued directed to the above-named defendants, Stulz-Sickles Company and Leitch Manufacturing Company, Inc., commanding them, and each of them, to appear before the said United States Circuit Court of Appeals for the Third Circuit, and that a transcript of the record, proceedings and evidence in said cause, duly authenticated, together with the exhibits, specified in the præcipe attached hereto, be sent to the said United States Circuit Court of Appeals for the Third Circuit.

Dated May 12, 1936.

THE BARBER ASPHALT COMPANY,

By PITNEY, HARDIN & SKINNER,

Solicitors for Plaintiff.

ORDER ALLOWING APPEAL.

(Filed May 14, 1936.)

Upon motion of counsel for plaintiff, The Barber Asphalt Company, in the above-entitled cause, it is hereby

ORDERED that an appeal to the United States Circuit Court of Appeals for the Third Circuit from the decree rendered and entered in the above-entitled cause on May 11, 1936, be and the same is hereby allowed.

It is further ORDERED that the record on appeal shall consist of the documents and exhibits specified in the præcipe accompanying the petition for appeal of the plaintiff heretofore filed herein.

It is further ORDERED that the clerk transmit to the clerk of the United States Circuit Court of Appeals for the Third Circuit all the documents and exhibits specified in the præcipe accompanying the petition for appeal of the plaintiff, and that citation issue to Stulz-Sickles Company and Leitch Manufacturing Company, Inc., defendants, in this cause returnable to the United States Circuit Court of Appeals for the Third Circuit within thirty days from the date hereof.

And it is further ORDERED that plaintiff give bond or undertaking according to law in the sum of two hundred fifty dollars ($250).

WILLIAM CLARK, *J.*

May 14, 1936.

BOND ON APPEAL.

(Filed June 1, 1936.)

KNOW ALL MEN BY THESE PRESENTS, That we, The Barber Asphalt Company, a corporation organized and existing under and by virtue of the laws of the State of West Virginia, as principal, and Fidelity and Deposit Company of Maryland, a corporation organized and existing under and by virtue of the laws of the State of Maryland, as sureties, are held and firmly bound unto Stulz-Sickles Company and Leitch Manufacturing Company, Inc., in the full and just sum of two hundred fifty dollars ($250) to be paid to the said Stulz-Sickles Company and Leitch Manufacturing Company, their certain attorneys, executors, administrators or assigns; to which payment well and truly to be made we bind ourselves, our heirs, executors and administrators, jointly and severally, by these presents. Sealed with our seals and dated this fifteenth day of May in the year of our Lord one thousand nine hundred and thirty-six.

WHEREAS, lately at a session of the United States District Court for the District of New Jersey, in a suit pending in said Court between The Barber Asphalt Company, plaintiff, and the said Stulz-Sickles Company and Leitch Manufacturing Company, defendants, a decree was rendered against the said The Barber Asphalt Company and the said The Barber Asphalt Company having obtained an appeal and filed a copy thereof in the clerk's office of the said Court to reverse the decree in the aforesaid suit, and a citation directed to the said Stulz-Sickles Company and Leitch Manufacturing Company, Inc., citing and admonishing them to be and appear at the United States Circuit Court

of Appeals for the Third Circuit, to be holden at the City of Philadelphia, within thirty days.

NOW THE CONDITION OF THE ABOVE OBLIGATION IS SUCH that if the said The Barber Asphalt Company shall prosecute its appeal to effect and answer all damages and costs if it fail to make its plea good, then the above obligation is void; else to remain in full force and virtue.

Sealed and delivered in the presence of

THE BARBER ASPHALT COMPANY,
By J. E. AUTEN,
President.
Attest:
E. R. RITER,
(Seal) *Secretary.*

G. SAND,
ROBT. A. BRADY,
RUSSELL A. CARDREY.

FIDELITY & DEPOSIT COMPANY
OF MARYLAND,
(Seal) By EMORY M. CANRIGHT.
Countersigned:
(Name Illegible)
Resident Agent.

Approved by

CITATION ON APPEAL.

(Filed June 2, 1936.)

To the Defendants, Stulz-Sickles Company and Leitch Manufacturing Company, Inc.

GREETING:

You and each of you are hereby cited and admonished to be and appear before the United States Circuit Court of Appeals for the Third Circuit, at the City of Philadelphia, Commonwealth of Pennsylvania, within thirty days from the date hereof, pursuant to an order allowing an appeal from the District Court of the United States for the District of New Jersey, in a suit wherein The Barber Asphalt Company is appellant and you are the appellees, to show cause, if any there be, why the decree rendered in your behalf should not be corrected, and why speedy justice should not be done to the parties on that behalf.

WITNESS, the Honorable William Clark, Judge of the District Court of the United States for the District of New Jersey, this first day of June, 1936.

WILLIAM CLARK,
Judge of the District Court for the District of New Jersey.

(Seal)

PRÆCIPE.

(Filed May 14, 1936.)

To the Clerk of the Court:

Please prepare a transcript of the record in the above cause for the purpose of appeal allowed therein, and include in such transcript the following:

PLEADINGS AND PROCEEDINGS.

1. Bill of complaint.
2. Answer to bill of complaint.
3. Amendment to answer to bill of complaint.
4. Plaintiff's and defendants' testimony in condensed or narrative form.
5. Opinion of Trial Judge filed March 21, 1936.
6. Final decree entered May 11, 1936.
7. Petition for appeal.
8. Assignment of errors.
9. Order allowing appeal.
10. Citation.
11. Bond.
12. Præcipe for transcript of record.
13. Stipulation as to transmission of record.
14. Clerk's certificate.

PLAINTIFF'S DOCUMENTARY EXHIBITS.

1. Patent in suit, Hayden No. 1,684,671.

2. Stipulation of fact, dated September 7, 1934.

3. Chart entitled "Properly Cured Concrete"—"Inadequate Curing."

4. Table entitled "Tests to Determine Quantity of Mixing Water Lost by Evaporation from Concrete Blocks of Different Depths."

5. Chart entitled "Mixing Water Lost by Evaporation from Concrete Test Blocks of Different Depths."

6. Chart entitled "Water Loss Through Top Surface of Uncovered Concrete During First 15 Hours after Moulding."

7. Drawing entitled "Typical Concrete Retaining Walls."

8. Sketch.

9. Porter translation of Lechler German Patent No. 337,134.

10. "Technischer Wortschatz," by Hager et al., printed at Stuttgart and Berlin, 1920, page 9.

DEFENDANTS' DOCUMENTARY EXHIBITS.

1. German book on concrete, page 351.

2. Pineles translation of Exhibit D-1.

3. Howard translation of Lechler German Patent No. 337,134.

4. German Patent to Lechler 337,134.

5. File wrapper of patent in suit, Hayden No. 1,684,671.

STIPULATION.

It is hereby stipulated and agreed by and between counsel for the parties to the above-entitled suit that the documents and exhibits specified in the foregoing præcipe shall constitute the transcript of record for the purpose of appeal, and that counsel by stipulation may dispense with the printing of such of the exhibits as in their judgment it is impracticable to reproduce or are unnecessary for the consideration of the Appellate Court.

It is further stipulated and agreed that either party may refer to the original transcript of the record for correction of errors in the printed record if such should appear.

PITNEY, HARDIN & SKINNER,
Solicitors for Plaintiff.
OSBORNE, CORNISH & SCHECK,
Solicitors for Defendants.

May 12, 1936.

[fol. 127] IN THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE THIRD CIRCUIT, OCTOBER TERM, 1936

No. 6171

THE BARBER COMPANY, INC., Plaintiff-Appellant,

vs.

STULZ-SICKLES COMPANY et al., Defendants-Appellees

And afterwards, to wit, the 7th day of December, 1936 come the parties aforesaid by their counsel aforesaid, and this case being called for argument sur pleadings and briefs, before the Honorable Joseph Buffington, Honorable J. Warren Davis and Honorable J. Whitaker Thompson, Circuit Judges, and the Court not being fully advised in the premises, takes further time for the consideration thereof,

And afterwards, to wit, on the 19th day of April, 1937, come the parties aforesaid by their counsel aforesaid, and the Court, now being fully advised in the premises, renders the following decision:

[fol. 128] IN THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE THIRD CIRCUIT, OCTOBER TERM, 1936

No. 6171

THE BARBER ASPHALT COMPANY, Plaintiff-Appellant,

v.

STULZ-SICKLES COMPANY and LEITCH MANUFACTURING COMPANY, INC., Defendants-Appellees

PETITION FOR LEAVE TO FILE A BILL IN THE NATURE OF A SUPPLEMENTAL BILL IN THE COURT BELOW

Now comes the plaintiff-appellant and The Barber Company, Inc., a corporation organized and existing under the laws of the State of New Jersey, and having its principal place of business at 1600 Arch Street, Philadelphia, Pennsylvania, by Busser & Harding, its solicitors, and the solicitors for the above-entitled plaintiff-appellant, and upon the annexed bill in the nature of a supplemental bill of complaint, prays this Court for an order granting leave to apply

to the District Court of the United States for the District of New Jersey, from which Court this appeal was taken, for leave to file therein the said bill in the nature of a supplemental bill of complaint and for such further orders as may be necessary to effect stipulation of The Barber Company, Inc.; for The Barber Asphalt Company as plaintiff and give the said The Barber Company, Inc., the benefit of the original bill of complaint and of any and all pleadings or other proceedings had in said Court subsequent to the filing of said original bill of complaint; directing such substitution as plaintiff-appellant in this Court; and for such additional or further relief as this Court may deem appropriate.

Busser & Harding, Solicitors for Plaintiff-Appellant and The Barber Company, Inc.

December 7, 1936.

[fol. 129] IN THE UNITED STATES DISTRICT COURT DISTRICT OF NEW JERSEY

In Equity. No. 4911. On Hayden Patent No. 1,684,671

THE BARBER COMPANY, INC., Plaintiff,

v.

STULZ-SICKLES COMPANY and LEITCH MANUFACTURING COMPANY, INC., Defendants

BILL IN THE NATURE OF A SUPPLEMENTAL BILL OF COMPLAINT

To the Honorable, the Judges of the District Court of the United States for the Judicial District of New Jersey:

The plaintiff above named, for its bill in the nature of a supplemental bill of complaint against the defendants above named, alleges and avers as follows:

1. That the plaintiff, The Barber Company, Inc., is a corporation organized and existing under the laws of the State of New Jersey, and having its principal place of business at 1600 Arch Street, Philadelphia, Pennsylvania.

2. That on and prior to the 18th day of July, 1934, The Barber Asphalt Company was the owner of the entire right, title and interest in and to United States Letters Patent No. 1,684,671.

3. That the said The Barber Asphalt Company, being vested with the title as aforesaid, and being advised that the said above named defendants had infringed, and were continuing to infringe, upon said Letters Patent in this district, heretofore to-wit, on or about the 18th day of July, 1934, [fol. 130] filed its bill of complaint in equity in this Court, and duly served the same on the defendants in the above cause, alleging infringement of said Letters Patent by said defendants, and praying for an injunction and an accounting and other suitable relief in respect thereto, as is more fully set forth in the bill of complaint in said cause now on file.

4. That on or about the 27th day of October, 1936, the said The Barber Asphalt Company, by an instrument in writing duly executed and delivered, and recorded in the United States Patent Office on November 11, 1936, in Liber R 168, Page 50, of the Transfers of Patents, assigned to the plaintiff, The Barber Company, Inc., all the right, title and interest in and to said Letters Patent No. 1,684,671, together with all claims for damages and profits by reason of past infringement of said Letters Patent, with the right to sue for and collect the same for its own use, all such rights to be held and enjoyed by the said The Barber Company, Inc., its successors and assigns as fully and entirely as the same would have been held and enjoyed by the said The Barber Asphalt Company had said assignment not been made, all of which will more fully appear from the original, or a duly certified copy, of said assignment, which is ready in Court to be produced, and of which plaintiff hereby makes due profert.

5. That by proper and legal procedure by the directors and stockholders of the said The Barber Asphalt Company, that corporation has now been dissolved in accordance with the laws of the State of West Virginia.

6. That by reason of the foregoing, The Barber Asphalt Company has no longer any interest in the above entitled cause, and the plaintiff, The Barber Company, Inc., has acquired the title and interest of said The Barber Asphalt Company, and has ever since remained, and now is, the sole and exclusive owner of the said Letters Patent.

[fol. 131] Wherefore, on this bill in the nature of a supplemental bill of complaint, and upon the original bill of com-

plaint, the plaintiff prays for the relief asked for in said original bill of complaint.

The Barber Company, Inc., by Frank Seamans, Vice-President.

Attest: G. W. Sands, Asst. Sect'y.

STATE OF PENNSYLVANIA,
County of Philadelphia, ss:

Frank Seamans, being duly sworn, deposes and says that he is the Vice-President of The Barber Company, Inc., the plaintiff above named, a corporation organized and existing under the laws of the State of New Jersey; that he has read and knows the contents of the foregoing bill in the nature of a supplemental bill of complaint; and that the same is true to his own knowledge and belief.

Frank Seamans.

Subscribed and sworn to before me this 7th day of December, 1936. O. H. Hertkorn, Notary Public. My Com. Expires Jan. 26, 1937. (Seal.)

Received & Filed Dec. 7, 1936. Wm. P. Rowland, Clerk.

[fol. 132] IN THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE THIRD CIRCUIT, OCTOBER TERM, 1936

No. 6171

THE BARBER ASPHALT COMPANY, Plaintiff-Appellant,

v.

STULZ-SICKLES COMPANY and LEITCH MANUFACTURING COMPANY, INC., Defendants-Appellees

ORDER

Upon petition by the plaintiff-appellant and by The Barber Company, Inc. for leave to file the annexed verified bill in the nature of a supplemental bill of complaint in the District Court of the United States for the District of New Jersey, from which Court this appeal was taken, and for other relief, and upon the sub-joined consent of the solicitor for the defendants-appellees, it is hereby

Ordered:

1. That leave is hereby granted the said petitioners to apply to the District Court of the United States for the District of New Jersey, from which Court this appeal was taken, for leave to file therein the said bill in the nature of a supplemental bill of complaint and for such further orders as may be necessary to effect substitution of The Barber Company, Inc., for The Barber Asphalt Company as plaintiff and give the said The Barber Company, Inc., the benefit of the original bill of complaint and of any and all pleadings or other proceedings had in said Court subsequent to the filing of said original bill of complaint.

[fol. 133] 2. And that the above entitled appeal henceforth shall proceed in the name of The Barber Company, Inc., as plaintiff-appellant.

For the Court, Buffington, J.

December 7, 1936.

Consent

Consent is hereby given to the entry of the foregoing order without other notice of said order.

Samuel Osterlenk, Solicitor for Defendants-Appellees:

Received & Filed Dec. 7, 1936. Wm. P. Rowland, Clerk.

[fol. 134] In the United States Circuit Court of Appeals for the Third Circuit, October Term, 1936

No. 6171

The Barber Asphalt Company, Plaintiff-Appellant,

v.

Stulz-Sickles Company and Leitch Manufacturing Company, Inc., Defendants-Appellees

Appeal from the District Court of the United States for the District of New Jersey

Opinion—Filed April 19, 1937

Before Buffington, Davis and Thompson, Circuit Judges

Buffington, J.:

The primary question in this case is the validity of patent No. 1,684,671, granted September 18, 1928 to Harold P.

Hayden, assignor to Barber Asphalt Company, the present plaintiff, for "method of preventing evaporation from concrete during curing." The practice of the art prior to the patent in suit, the objections thereto, the novel means the patentee disclosed to overcome these objections, their effec- [fol. 135] tiveness and money saving, are set forth in his patent specification, which we adopt, in view of the proofs, as the facts of the case, to wit:

"In modern cement concrete construction it is desirable to retard the evaporation of water from the concrete after it is placed and during the curing period in order to insure thorough hydration of the cement and thus produce a concrete of maximum strength.

Heretofore various methods of protecting concrete during the curing period, especially in roadway and the like construction where the concrete has a large exposed surface, have been used, for example, one well known method used in roadway and the like construction involves the application of wet burlap to the exposed surface of the concrete immediately after finishing, the burlap being kept wet, as by sprinkling, until the concrete has set, or attained a rigidity such as to withstand a substantial weight without marring, after which the burlap is removed and the surface covered with earth, or straw, which is maintained wet until the expiration of the stipulated curing period, when the earth, or straw, is removed. Another method, which has been attempted, involves the spreading of tar on the surface of concrete after the concrete has set, or attained a rigidity such as to enable workmen to walk on it without marring the surface. Still another method involves the provision of dikes about the concrete for maintaining a pond of water on its surface until it is ready for use.

The methods heretofore used for protecting concrete during the curing period are open to numerous objections, more especially in that they involve substantial expense and are ineffective in preventing the evaporation of water from the concrete during the critical period before the concrete has set, or the protection of the concrete is not attempted until [fol. 136] substantially after the critical period has passed, as is evidenced, for example, by the occurrence of hair cracking, which is avoided by the practice of the method according to my invention.

I have discovered that if cement or cement concrete be treated, after it is finished, i. e., smoothed off, or broomed if so finished, and before it has set, i. e., before it will support a substantial weight, such as that of a man walking on it, without marring, by the formation on the exposed surface thereof a water impervious film, which preferably will adhere to the concrete, and the concrete be then permitted to set and cure without disturbance, the concrete will cure without hair cracking, and when cured will be found to have greatly increased strength, durability and resistance to weathering as compared to concrete treated by the methods heretofore known.

In accordance with my invention, I apply the water impervious film to the exposed surface of cement or concrete to be cured before it has set, by which, as has been indicated, I mean before the concrete has attained a condition of firmness or rigidity such that it will support a substantial weight without marring of the surface, as for example, the weight of a man walking on it. Preferably, the film is applied as soon as practical after the cement or concrete is laid and finished; however, it must be applied before the concrete has set, as indicated above, if the benefits of my invention are to be obtained.

In accordance with my invention, the water impervious film, when applied before the cement or concrete has set, as indicated, acts to prevent evaporation of water from the cement or concrete, and especially from exposed surface thereof, or to retain sufficient original water in the cement or concrete, during that period in which the continuous presence of requisite water is essential for the hydration of the cement and the avoidance of hair cracking of the surface. [fol. 137] As illustrating different applications of the principle of my invention I will give the following examples:

A bituminous paint such as ordinary liquid asphalt paint, consisting of a residual asphalt base of twenty to thirty penetration at 77° F., or native asphalt, dissolved in a volatile petroleum solvent may be used as the coating for this purpose. Such a paint when applied, for example at the rate of one gallon per 100 sq. ft. as soon as practical after pouring and finishing of the concrete, but in any event before the concrete has set, will form a satisfactory protective impervious film, and prevent evaporation of water from the concrete during curing.

Ordinary linseed oil paint will also form a satisfactory impervious film if applied in sufficient quantity after the superficial water has subsided after pouring and finishing of the concrete.

Still another method of practicing my invention, and one that is distinctly preferred possesses further advantages. To the surface of wet unset concrete and preferably as soon as practical after laying and finishing I apply, as by means of a spray, a water-external-phase bituminous emulsion such as is often called in paving practice 'cold repair cement'. Such emulsion possesses the property of breaking after a short exposure to the air in consequence of the evaporation of the water, with the formation of a water impervious adherent film of bitumen on the surface of the concrete.

I have found that cement concrete which has thus been protected by the application thereto, when freshly placed, or before it has set, of a water impervious and preferably adherent film possesses a remarkably higher tensile strength after curing or aging than is possessed by the same concrete not so treated, and the occurrence of hair cracks is avoided.

Films of this character may be formed with great ease by [fol. 138] applying the coating medium by means of a paint spray. In roadway construction a bituminous emulsion may be applied as soon as the surface is finished.

The cost of material and labor involved in this method of treating concrete is relatively low, in comparison with the cost of materials and maintenance in a moist condition by any other method of treatment, and the results are not dependent upon the subsequent care of the work after the film is once in place it being only necessary after the application of the film to permit the concrete to set and become sufficiently cured without disturbance of the body thereof.

When using the old methods, it is frequently impossible to keep concrete properly wetted for the requisite curing period, but with my new method the curing proceeds without interruption to completion. This is of particular advantage in road construction as construction traffic may be directed over the new concrete after say one week without interrupting the curing of same."

Upon this disclosure, there was granted, inter alia, the here involved claims 4, 5 and 9, as follows:

"4. The method of preventing evaporation of water from the surface of a freshly laid concrete roadway which includes spraying upon such surface, before the concrete has set, a bituminous emulsion for the formation of an adherent water impervious bituminous film thereon.

5. The method of curing a concrete roadway which includes applying to the supper surface of a roadway, before the concrete has set, a coating of unheated bituminous paint-like material for the formation of a water impervious film thereon, and permitting the concrete to cure.

9. The method of curing a body of cement concrete having an exposed surface, which includes applying to the ex- [fol. 139] posed surface of the concrete, before the concrete has set, a water-external-phase bituminous emulsion for the formation of an adherent water-impervious film on such surface and thereafter permitting the concrete to cure without substantial disturbance of the body thereof."

The make-up of concrete and the action of water in forming it are well known. It is caused by the chemical action of water on powdered Portland cement mixed with sand and crushed stone. When first mixed, the resultant is physically, as the proofs show, very soft and offers no resistance whatever to any weight placed on it or anything coming in contact with it. It would immediately sink of its own weight. But hydration, or the action of the water, goes on and in a few hours the mixture is "set". Thereafter the hydration proceeds constantly and "cures" the mix, with the result of stonelike hardness being attained. Describing the practice prior to the patent in suit, an experienced engineer testified:

"Q. 39. What disadvantages found in roadways prior to the summer of 1925 are cured by the operation of the Hayden process?

A. Considerable difficulty was encountered in roads at that time due to what is known as surface crazing or cracking. That means formation of what are sometimes referred to as mat cracks on the immediate surface of the concrete, and those cracks result from the shrinkage of the surface due to the loss of water and the mere fact that the concrete is shrunk at that point indicates that certain changes

are going on which are likely to be disastrous as far as the surface resistance of the concrete is concerned.

Q. 40. How about the hydration of the cement during that period?

A. Well, the hydration of the cement will continue so long as water is present, but the moment the w ter is removed the hydration ceases.

[fol. 140] Q. 41. Was the hydration of the c ment adjacent to the surface of the roadway interrupted or continuous during the methods used for the protection or rather lack of protection during the settling period prior to 1925?

A. It was interrupted by the premature drying of the surface and the attempt later to put water on to correct that.

Q. 42. Did that subsequent application of water correct the harm done during the settling period or not?

A. It does not.

Q. 43. And how did that show up in the final road in use?

A. It shows up by abrasion of the surface, producing a rough surface after the road has been under traffic for some time.

Q. 44. Was the surface concrete of such a road as good as what I may call the main body of the slab?

A. It was not; the surface was very much poorer than the main body of the concrete."

Describing the hydration of the existing art, the critical state of the concrete when laid and the bringing of a bituminous emulsion into roadway construction, and that the problem was one reached only after original and protracted experimentation, is shown by Hayden, who testified:

"Q. 28. Your original concept despite your original use of emulsion for the formation of this film, included the use of other bituminous film forming materials, did it not?

A. Yes, we studied paint-like materials, solutions of bitumen in volatile solvents, for example.

Q. 29. Now, does the bituminous emulsion have any particular advantage over other paint-like materials?

A. In our opinion it does.

Q. 30. Will you explain how the bituminous emulsion affects the formation of a film after it is sprayed on the sur-[fol. 141] face of the wet concrete and how it is advanta-

geous, for example, over a solution of bitumen in an oil of some kind?

A. The bituminous emulsion is usually made with a soap as the protective colloid. This soap is a chemical compound which is constituted by the combination of an organic acid such as oleic acid or abietic acid with sodium; in other words, the soap might be sodium oleate, that would be the simplest type of soap. When this emulsion system is brought in contact with the surface of the concrete it encounters calcium ions which are in solution in the mixing water, and calcium, which is actually in the ingredients of the concrete. When the soap of the emulsion makes contact with this calcium or other earth metal salts, ions, the soap is converted into an insoluble soap. To illustrate the difference between the soluble and insoluble soap, we might refer to the ring in the bathtub. The soap you see in the bathtub is the soluble sodium oleate essentially. You bring it in contact with the calcium salts in the water and it is converted into an insoluble calcium soap."

Testifying as to his method supplanting the use of burlap, Hayden's testimony was:

"Q. 58. Is it possible to apply burlap without marring the surface within the critical and essential period in which you apply your bituminous film?

A. Scarcely. There has been improvement since my invention came to issue, but it is scarcely possible to apply—it is impossible, as a matter of fact, to apply burlap as early as it is possible to apply this bituminous film.

Q. 59. Then do I understand——

A. On account of marring the surface. You can readily see that if the bituminous film is applied as an atomized spray that it may be applied without marring at once as soon as the finisher has completed his task, whereas in the application of burlap the inspectors will not permit the [fol. 142] application of the burlap until the surface has assumed sufficient strength to resist the very slight abrasion effect of the burlap during its applications.

* * * * * * *

Q. 63. Is it necessary after the application of the bituminous film in accordance with the method of your patent to do anything else with respect to protection or conditions of water?

A. One of the particular merits of our invention seems to be the positive indication of adequate application, the contrast in color between the bituminous film and the gray surface of the concrete permits the inspector to determine at a glance that the surface is entirely covered and he needs worry about it no more during the curing period.

Q. 64. Is it necessary to do anything at all after you cover the surface with the bituminous film?

A. The road is barricaded but otherwise nothing is done.

Q. 65. Is it necessary to add any water to it, to sprinkle it?

A. No water could get to the concrete if applied. The film is impervious.

Q. 66. Is it necessary to put any hay or straw over it?

A. It is not."

Without entering into details, the proofs show that the process of the patent has increased the surface strength of the roadway 40% and has gone into extensive use. Indeed, an experienced witness for the defendant pays tribute to it, saying: "The beauty of this patent is to reduce expense decidedly * * * it is a very valuable addition to the art, your patent. It spurred others to find some new way to compete with it." Indeed, when we consider the fact that the use of masses of burlap bags, damp soil, and tarpaulins covering miles of roadway, was done away with and in their [fol. 143] place was substituted as an enveloping, moisture-retaining agency, an invisible, weightless spray of bituminous emulsion which more quickly effected a material increase of roadway surface hardness, we have before us an invention which if not a pioneer, is certainly one of very high merit.

After practical examination and, as we see it, after receding from its earlier view, the patent office granted the claims here involved with the limitation of using the spray "before the concrete is set." Thus in claim 4 we have the element "spraying upon such surface, before the concrete has set, a bituminous emulsion"; in claim 9, applying "before the concrete has set, a water-external-phase bituminous emulsion;" and in claim 5, applying "before the concrete has set, a coating of unheated bituminous paint-like material."

From the proofs it is clear that these elements, (a) the bituminous emulsion, (b) the spraying of it, and (c) the doing so before the concrete is set, are the gist, so to speak, of Hayden's process. And if such is the case, this elimi-

nates the German patent, No. 337,134, issued in 1921 to Lechler, which the court below considered a complete anticipation.

Lechler, in his disclosure, stated the well known fact that "cement concrete attains great strength much more quickly if it is kept moist during the hardening (lapidifying) period", and that his new process consists in that the still-fresh concrete is so enclosed on all sides with a coating material which is resistant to water. He nowhere referred to or disclosed any suggestion of its use in roadway construction or of spraying a bituminous emulsion. On the contrary, his primary idea was to use forms to shape concrete articles and after such articles were set, remove them from the forms and then dip them in a bituminous bath—whatever it was. His directions were: "Cement articles, as [fol. 144] soon as they have sufficiently set and can be removed from the form, are dipped in the coating material, or are coated therewith on all sides." Manifestly, this threw no light on road construction and that art, furnished, as it was, with able engineering staffs, eager for improvement, continued to use the old methods for the seven years that intervened between Lechler's and Hayden's patents. Nor does Lechler's suggestion of the use of his patent in "concrete structures, such as retaining walls, foundations, and the like", throw any light on concrete roadway construction. There is no proof as to how such process could be practically used and the proof is that it could not be practically utilized. It will thus be seen that Lechler failed to meet the standard of anticipation laid down by this court in 31 Fed. (2d) 427, that "a patent relied upon as an anticipation must itself speak. Its specification must give in substance the same knowledge and the same directions as the specifications of the patent in suit".

The patent being valid, we next consider the question of infringement. The stipulation is that the Standard Bitulithic Company used the patented process in road construction in this circuit in 1933. Having no license, a decree must and would have gone against it had it been a party to this suit. In point of fact, the defendants are two companies which are charged with contributory infringement. As to their contribution to the infringing wrong, the stipulation is "that the defendants, Stulz-Sickles Company and Leitch Manufacturing Company, Inc. in August and September, 1933, sold and delivered to Standard Bitulithic Company,

at Newark, New Jersey, a quantity of bituminous (asphalt) emulsion, with knowledge that the emulsion was to be used by Standard Bitulithic Company for the curing of a con- [fol. 145] crete roadway in Newark, New Jersey, by spraying the emulsion on the surface of unset, freshly laid, uncured concrete roadway, for the formation of a waterproof bituminous film on the surface of the roadway, for the prevention of the evaporation of water from the concrete during curing; and such emulsion was sold and delivered by the defendants, Stulz-Sickles Company and Leitch Manufacturing Company, Inc. to Standard Bitulithic Company, for the curing of a concrete roadway, as described; and that such emulsion was, in fact, to the knowledge of the defendants, Stulz-Sickles Company and Leitch Manufacturing Company, Inc., used by Standard Bitulithic Company, in August and September of 1933, at Newark, New Jersey, as described, the concrete roadway being left undisturbed until cured after the spraying of the emulsion on the surface thereof. Defendants, Stulz-Sickles Company and Leitch Manufacturing Company, Inc., admit that said asphalt emulsion sold and delivered by defendants, as stipulated in Paragraph 4 hereof, was used by Standard Bitulithic Company, in August and September of 1933, at Newark, New Jersey, for curing concrete roadway in accordance with the method defined by the claims of the patent No. 1,684,671 in suit, and that said asphalt emulsion was sold and delivered by the defendants to Standard Bitulithic Company with knowledge that it was to be so used."

Notwithstanding their wilfully and purposely aiding, abetting and making possible the contractor's deliberate infringement of the patent, the defendants claim immunity by reason of the fact that Hayden's application was assigned to, and the patent granted to, The Barber Asphalt Company, the plaintiff. It was a dealer in bituminous emulsion—an unpatented product—and it is contended to hold them as infringers would be given the patent a monopoly [fol. 146] of an unpatened article. In support of such contention they cite Carbice Corporation v. American Patents Dev. Corp., 283 U. S. 27. We cannot agree with that contention. In that case the patent was for a container, and such container the patentee had sold to the defendant and in selling sought to restrict the buyer's use in the container of an unpatented produce made by the owner of the patent. This, the court held, the patentee could not do. Having sold the

container, the patentee granted to the buyer the unrestricted use to him.

The case before us is wholly different. There was no sale of the process to the contractor; no relation whatever existed between him and the patent owner. He is a simple infringer, nothing else, and the defendants, who stand in no different light, charged with knowledge of the patent, advised that the contractor intended to infringe, in order to profit thereby, sold to such contractor their bituminous emulsion, whereby the contractor could infringe the patented process. The question of whether the Barber Company, as owner of the patent, could, in granting a license, limit its licensee to using its bituminous emulsion, is not here involved and on that question we express no opinion. In the present case, the defendants are contributory infringers and, so holding, the decree dismissing the bill is vacated and the record remanded with direction to the court below to enter a decree adjudging the claims in issue valid and infringed and awarding an accounting.

THOMPSON, J. dissenting:

The appellant seeks to restrain the sale of an unpatented ingredient used by it in its process. No patent could have been obtained for bituminous emulsion, a staple article of commerce, and the fact that it is used in the patented process [fol. 147] does not entitle the appellant to a monopoly therein. Carbice Corp. v. Am. Patents Corp., 283 U. S. 27. Miller v. Electro Bleaching Gas Co., 276 Fed. 379. In my view the bill was properly dismissed and the decree of the court below should be affirmed.

A true Copy. Teste:

——— ———, Clerk of the United States Circuit Court of Appeals for the Third Circuit.

[fol. 148] IN THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE THIRD CIRCUIT, OCTOBER TERM, 1936

No. 6171

THE BARBER COMPANY, INC., Plaintiff-Appellant,

vs.

STULZ-SICKLES COMPANY and LEITCH MANUFACTURING COMPANY, INC., Defendant-Appellees

Appeal from the District Court of the United States, for the District of New Jersey

This cause came on to be heard on the transcript of record from the District Court of the United States, for the District of New Jersey, and was argued by counsel.

On consideration whereof, it is now here ordered, adjudged, and decreed by this Court that the decree of the said District Court in this cause be, and the same is hereby reversed, with costs, and the case remanded to the said District Court with instructions to enter a decree adjudging the claims in issue of the patent in suit valid and infringed, and awarding an accounting.

Philadelphia, April 19, 1937.

Per Curiam Buffington, Circuit Judge.

Endorsements: Order Reversing Decree etc. Received & Filed, April 19, 1937. Wm. P. Rowland, Clerk.

[fol. 149] UNITED STATES OF AMERICA,
Eastern District of Pennsylvania,
Third Judicial Circuit, sct.:

I, Wm. P. Rowland, Clerk of the United States Circuit Court of Appeals for the Third Circuit, do hereby certify the foregoing to be a true and faithful copy of the original Transcript of Record and proceedings in this Court in the case of The Barber Company, Inc., Appellant, vs. Stulz-Sickles Company, et al., Appellees, No. 6171, on file, and now remaining among the records of the said Court, in my office.

In Testimony Whereof, I have hereunto subscribed my name and affixed the seal of the said Court, at Philadelphia,

this 5th day of May, in the year of our Lord one thousand nine hundred and thirty-seven and of the Independence of the United States the one hundred and sixty-first.

Wm. P. Rowland, Clerk of the U. S. Circuit Court of Appeals, Third Circuit. (Seal United States Circuit Court of Appeals, Third Circuit.)

[fol. 150] [Stamp:] Office of the Clerk, Supreme Court, U. S. Received Jun. 30, 1937.

SUPREME COURT OF THE UNITED STATES, OCTOBER TERM, 1937

No. ——

STULZ-SICKLES COMPANY and LEITCH MANUFACTURING COMPANY, INC., Petitioners,

vs.

THE BARBER COMPANY, INC., Respondent

NOTICE OF PETITION FOR WRIT OF CERTIORARI

You are herewith informed that a petition for writ of certiorari is to be filed in the Supreme Court of the United States in the above-entitled suit. If you do not wish to be a party to this petition, you are respectfully requested to so indicate below.

Yours, etc., Samuel Ostrolenk, Attorney for Petitioners.

Dated, New York, N. Y., June 29, 1937.

To Stulz-Sickles Company, 134 Lafayette Street, Newark, N. J.

We herewith instruct you not to make us a co-petitioner in the above-entitled suit.

Stulz-Sickles Company, by Edw. A. Stulz, Pres.

Newark, N. J., June 29, 1937.

[fol. 144] SUPREME COURT OF THE UNITED STATES

ORDER ALLOWING CERTIORARI—Filed October 11, 1937

The petition herein for a writ of certiorari to the United States Circuit Court of Appeals for the Third Circuit is granted, and the case is assigned for hearing immediately following Nos. 72 and 357.

And it is further ordered that the duly certified copy of the transcript of the proceedings below which accompanied the petition shall be treated as though filed in response to such writ.

Mr. Justice Black took no part in the consideration and decision of this application.